US Department of the Navy, Northern Division
Naval Facilities Engineering Command

Draft Environmental Impact Statement

Disposal and Reuse *of* Naval Station Brooklyn Brooklyn, New York

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Abstract:

The US Department of the Navy plans to dispose of Naval Station (NAVSTA) Brooklyn, located in Brooklyn, New York. The NAVSTA Brooklyn site consists of about 28.8 acres (11.7 hectares) and is adjacent to the former Brooklyn Naval Shipyard, which was excessed by the Navy in 1966. This EIS considers the potential effects of the disposal and reuse of NAVSTA Brooklyn by the Local Reuse Authority (the City of New York) in accordance with their reuse plan. In addition, the potential effects of three other action alternatives and the no action alternative are examined.

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EXECUTIVE SUMMARY

S.1 Purpose and Need

The Navy plans to dispose of Naval Station (NAVSTA) Brooklyn, which is located in Kings County, New York City (NYC). The NAVSTA Brooklyn property, which is approximately 28.8 acres (11.7 hectares), is adjacent to the former Brooklyn Naval Shipyard (Navy Yard) that was excessed by the Navy in 1966, transferred to the City of New York, and presently functions as an industrial park managed by the Brooklyn Navy Yard Development Corporation (BNYDC), a subsidiary of the NYC Economic Development Corporation (EDC). Photo S-1 shows the site in the context of the Navy Yard and surrounding community.

NAVSTA Brooklyn is comprised of the Naval Hospital, its ancillary buildings, grounds, and cemetery, as well as several industrial buildings that were functionally part of the Navy Yard. The NAVSTA Brooklyn site has been owned by the Navy for over 170 years and functioned as an annex to the Naval Shipyard, established in 1801. The NAVSTA Brooklyn site is considered eligible by the NY State Historic Preservation Office (SHPO) as two historic districts on the National Register of Historic Places, and includes two NYC-landmarked buildings (the Hospital and the Surgeon's House). The Naval Hospital was decommissioned in 1948. Substantial demolition of buildings occurred between 1975 and 1985, so that only 35 buildings and additional various infrastructure facilities constructed between 1838 and 1975 remain, with approximately 657,000 square feet (sq ft) (61,000 square meters [sq m]) of space.

In December 1988, the Base Closure and Realignment Commission recommended that NAVSTA Brooklyn be closed and its functions be relocated to the new NAVSTA New York on Staten Island. The Navy, acting as the disposal agency for NAVSTA Brooklyn, has completed its formal procedures for disposal of the property. With respect to the McKinney Assistance Act and its 1994 amendment, the City of New York has reached an agreement with the US Department of Housing and Urban Development (HUD) to enable HELP Homeless Service Corporation develop transitional housing and support services at the Manhattan Children's Psychiatric Center on Wards Island, instead of the NAVSTA Brooklyn site.

In March 1996, the NYC Mayor's Office of Planning and Community Relations, acting as the local reuse authority (LRA), adopted a proposed reuse plan titled *Redevelopment Plan for Naval Station Brooklyn, New York.* This plan is presented as the preferred reuse alternative that, along with its alternatives, is analyzed in this Environmental Impact Statement (EIS).

S.2 Description of the Proposed Action and Alternatives

The proposed action is the disposal and reuse of NAVSTA Brooklyn pursuant to the LRA's preferred Reuse Plan that was published March 1, 1996. Other alternatives are also considered in this EIS: the No Action Alternative, the Residential Alternative, the Museum Alternative, and the As-of-Right Alternative. These alternatives represent a range of development uses and resulting impacts that might occur with disposal and reuse of NAVSTA Brooklyn.

S.2.1 Reuse Plan - The Preferred Alternative

The major elements of the LRA's proposed Reuse Plan are shown in Figure S-1 (Reuse Plan) and in Table S-1. The redevelopment plan capitalizes on the site's assets in terms of its industrial facilities and proximity to the rest of the Brooklyn Navy Yard, and seeks to minimize any impacts on the historic campus of the hospital. No new construction is proposed; rather, the plan calls for the reuse, for industrial or commercial activity, of buildings used by the Navy for such purposes, and the adaptive reuse of residential and hospital facilities for community institutional purposes. Following is a brief description of each component of the Reuse Plan:

Of the three areas proposed for activities to generate jobs and tax revenue, two are oriented for industrial jobs:

- Northern triangle: Consisting of 2.2 acres (0.9 hectares), this area includes two small buildings totaling about 12,300 sq ft [1,143 sq m]) that are appropriate for light industry or warehousing, remaining space on the parcel could be for parking; and

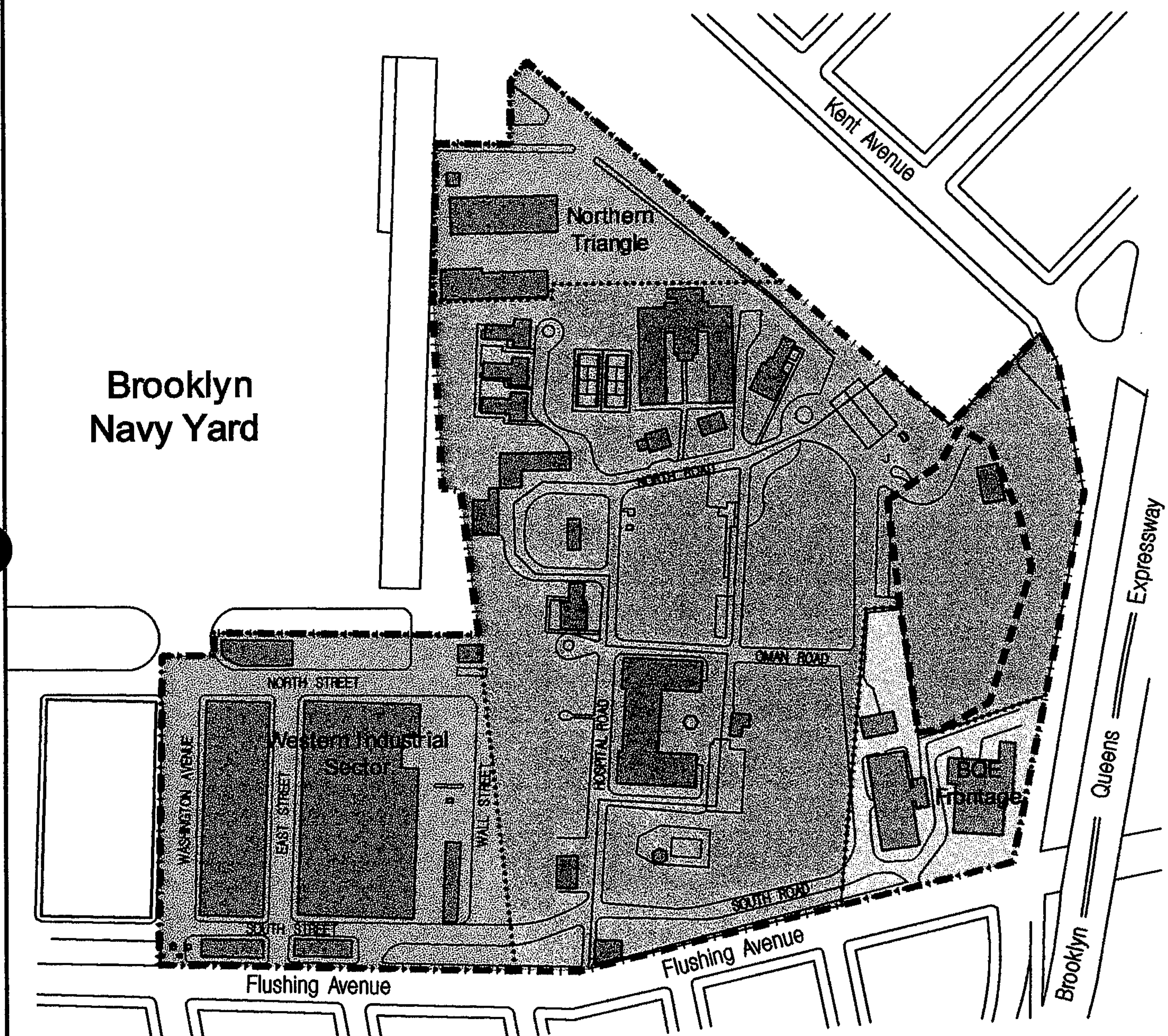
- Western industrial sector: This area of 6.4 acres (2.6 hectares) includes two major buildings. Building 1 is the seven-story lab building, with about 245,100 sq ft [22,770 sq m] suitable for a variety of high-tech manufacturing, research, or a mix of light industry and offices. Building 2 is the foundry building, with about 118,500 sq ft [11,000 sq m] suitable for a variety of industrial uses. This area also includes two smaller two-story office buildings.

The third parcel is proposed for new commercial uses:

- Brooklyn-Queens Expressway (BQE) (I-278) frontage: At the site's southeast corner, fronting on Flushing Avenue and Williamsburg Street West and facing the elevated BQE, this parcel of about two acres (0.8 hectares) includes three buildings totaling 52,500 sq ft (4,870 sq m). Because of its highly accessible location, this portion of the site could be easily utilized for small-scale convenience retail.

Photo S-1. Aerial view of NAVSTA and surrounding area (Source: Brooklyn Navy Yard Development Corporation).

The Reuse Plan



Hospital Campus
Industrial
Commercial
Sector Boundary
Cemetery Boundary
Property Boundary

250 0 250
Scale in Feet (Approximate)
50 0 50
Scale in Meters (Approximate)

N

Source: NYC Redevelopment Plan, 1996.

Figure S-1

Table S-1

Reuse Plan Land Use Program

Sector/ Use	Area		Estimated Development in Existing Structures (000s sq ft [sq m])				Publicly Accessible Open Space Acres (Hectares)			Est. Parking Spaces
	Acres (Hectares)	% of Total	Industrial	Commercial	Institutional	Total	Active	Passive	Cemetery	
Northern Triangle/ Industrial	2.2 (0.9)	7.6	32.0 (3.0)	0	0	32.0 (3.0)	0	0	N/A	200
Western Industrial Sector	6.4 (2.6)	22.1	427.8 (40.4)	0	0	427.8 (40.4)	0	0	N/A	400
BQE Frontage	2.0 (0.8)	6.8	0	52.5 (4.9)	0	52.5 (4.9)	0	0	N/A	150
Hospital Campus	18.3 (7.4)	63.4	0	0	145.0 (13.5)	145.0 (13.5)	2.4 (0.97)	7.7 (3.1)	1.7 (0.7)	50*
Total**	28.8 (11.7)	100	459.8 (43.4)	52.5 (4.9)	145.0 (13.5)	657.2 (61.1)	2.4 (0.97)	7.7 (3.1)	1.7 (0.7)	800

Notes: * parking assigned to existing paved area, more could be provided at expense of unpaved areas.
** numbers may not add exactly due to rounding.
Source: *Redevelopment Plan for Naval Station Brooklyn, New York*, City of New York, 1996.

The remaining part of the site, known as the hospital campus (about 18.3 acres [7.4 hectares]), would be used for open space, recreational, and institutional/not-for-profit purposes. While no specific uses of the buildings are yet identified, possible uses include a day-care center, a health center, a job-training center, a school, or institutional offices. None of these community facility uses are permitted under the existing M3 zoning; thus, the LRA has proposed a rezoning to C8, which is a commercial district that allows non-residential community facilities.

The Naval Hospital Cemetery, a 1.7-acre (0.7-hectare) area in the eastern portion of the campus, was closed in 1910. In 1926, the Navy exhumed the remains and reinterred them at the National Cemetery at Cypress Hills (Brooklyn). The surface of the cemetery was regraded and converted to a recreation field in 1944. However, recent documentary research indicates that numerous interments were unaccounted for in the 1926 transfers and field testing at the site confirmed that burial remains are still present at the cemetery site.

At the time the LRA developed its Reuse Plan, it was unaware of possible human remains being still located in the area of the Naval Hospital Cemetery; consequently, this area was envisioned as continuing in use as an active ballfield. The Navy has subsequently developed a cemetery plan that will entail landscaping immediately outside the cemetery area, providing a grassy cover to the cemetery, re-establishing an appropriate cemetery presence for the Navy and Marine burials that remain there, and ensuring that the area remains as passive open space.

To implement the Reuse Plan, the City of New York would transfer control of the industrial/commercial parcels to the BNYDC and the publicly accessible open space would be placed under the control of the NYC Department of Parks and Recreation. No specific proposal is made with respect to the implementation of the institutional component because no users are designated at this time.

S.2.2 No Action Alternative

The No Action Alternative, developed as the future condition against which the impacts of the proposed action are measured, means that NAVSTA Brooklyn remains closed, and the land is not disposed of – it would remain as federal government land.

S.2.3 Residential Alternative

Under the Residential Alternative, buildings comprising the campus portion of the site would be converted to residential use. Those portions of the NAVSTA Brooklyn site designated for industrial and commercial use in the city's Reuse Plan would continue to be designated for these same uses under the Residential Alternative. No new residential construction is proposed, only the adaptive reuse of the hospital and upgrading of buildings that were formerly residential. A total of 94 units is

assumed and analyzed here, but somewhat fewer or greater numbers could be generated by subdividing buildings with alternate size units.

There is no formal sponsor for a residential alternative at this time, but the strong housing demand in Brooklyn could allow for a feasible market development of the site. The mix of building and unit types could make for interest in the campus portion of the site by some institutional sponsor, perhaps for a senior and/or assisted-living complex. Constraints to residential development at the site include its relative isolation by existing industrial uses, and the distance from the nearest subway (approximately 0.75 miles [mi] [1.2 kilometers {km}]).

Residential uses at the NAVSTA Brooklyn site would require a rezoning by the city from the existing M3 district to a district permitting residential use. An R6 zoning district, common in the study area, is assumed here as adequate to bring into conformity the residential conversions proposed under this alternative.

S.2.4 Museum Alternative

Under the Museum Alternative, buildings comprising the campus portion of the site would be converted to educational/exhibition uses. Those portions of the NAVSTA Brooklyn site designated for industrial use in the city's Reuse Plan (northern triangle and western industrial sector) would continue to be designated for those uses under this alternative; however, the BQE frontage, at Kent and Flushing Avenues, would also be included as part of the museum complex. No new construction is proposed, only the adaptive reuse of the hospital and other buildings that comprise the campus and BQE frontage portions of the site. In total, these buildings amount to approximately 233,000 sq ft (21,650 sq m) located on about 20 acres (eight hectares).

There is no formal sponsor or funding for the Museum Alternative at this time; however, two organizations have presented proposals of this nature. One is from the 369th Historical Society, an organization focused on the role of African-Americans in the US military. The other proposal is from the Wallabout Partners Associated, which advocates a "Children's National Science Harbor Exploratorium" with an 'exploratorium' of the ship repair functions that continue at the Navy Yard and a new waterfront park.

The Museum Alternative is not specifically defined but could accommodate elements common to both these "museum" proposals. Neither of the two museum proposals provide details on estimated costs of development or the number of jobs, students, or visitors. The numbers adopted for this review represent reasonable estimates based on other maritime-oriented museums. For purposes of this EIS, a reasonable estimate of 200,000 visitors per year (about 550 per day) is adopted for assessing traffic and other effects.

In order to conform to the NYC Zoning Resolution, a museum use on the site would require a rezoning on the areas of the site to be devoted to the museum to a C2-6. This zoning is for a general commercial district permitting this type of community facility, with a commercial FAR of 2.0 and with no parking requirement.

S.2.5 As-of-Right Alternative

Under the As-of-Right Alternative, the full buildout of the site as permitted by NYC zoning is assumed, with the retention of only four principal buildings: the hospital, Surgeon's House, the lab, and the foundry. The cemetery area would remain unbuilt as open space. All other structures would be demolished and new industrial/warehouse structures would be constructed to the maximum bulk permitted. A wide range of alternate uses are permitted under existing M3-1 zoning; consequently, the buildout assessed here is merely one possible scenario of as-of-right development.

The existing M3-1 zoning permits a maximum floor area of about 2,512,000 sq ft (233,500 sq m). Deducting the floor area of the retained buildings would provide maximum new construction of about 2,089,000 sq ft (194,000 sq m). Required parking (about 1,250 spaces) and roadways imply that the increment of floor space would need to be accommodated in three- to four-story structures. It is acknowledged that the demand for new three-story industrial/warehouse space is very limited in the city and that the scenario represents only a legal potential rather than a market likelihood.

S.3 Affected Environment, Impacts of Proposed Action and Alternatives, and Mitigation

The EIS provides a generalized overview of the affected environment, as well as an extended discussion of those environmental factors that could be potentially affected by the disposal and reuse of NAVSTA Brooklyn. With the exception of a Programmatic Agreement regarding cultural resources, mitigation measures deemed necessary and feasible would be implemented by the City of New York or an applicant proposing redevelopment at NAVSTA Brooklyn.

S.3.1 Land Use and Zoning

No Action Alternative

Under future no action conditions, the NAVSTA Brooklyn site would remain under federal control in a caretaker status. No reuse would occur.

Reuse Plan

Implementation of the Reuse Plan would result in the reuse of the site for industrial and commercial uses in the northern triangle, western industrial sector, and BQE frontage area (all to be managed as part of the adjacent BNYDC property), and for community institutional uses (including park and recreational uses) in the hospital campus area. The Reuse Plan would provide 11.8 acres (4.8 hectares) of publicly accessible open space, 2.4 acres (one hectare) of which would be for active recreation. Figure S-1 shows the allocation of the proposed uses superimposed on a plan of the existing base. The key land-use elements would be accessed from the existing street network of Flushing Avenue, Kent Avenue, and Williamsburg Street West.

The reuse of existing facilities would be consistent with current land uses in the surrounding community. However, NYC zoning would need to be changed to permit the community facilities, and the Reuse Plan calls for C8 zoning on the hospital campus area, thus permitting non-residential community facilities.

Residential Alternative

For the industrial and commercial sectors, the Residential Alternative incorporates land use components similar to those of the Reuse Plan, but proposes residential uses in the hospital campus area. As with the Reuse Plan, reuse of existing facilities under the Residential Alternative would be consistent with current land uses, but development of the new residential area would limit the provision of publicly accessible open space to the cemetery area. This alternative would require a rezoning, proposed here to be R6, of the hospital campus area to permit residences.

Museum Alternative

For the industrial sectors, the Museum Alternative incorporates land use components similar to those of the Reuse Plan, but proposes museum uses in place of the community facilities in the hospital campus area as well as the BQE frontage. As with the Reuse Plan, reuse of existing facilities under the Museum Alternative would be generally consistent with existing land uses of the neighborhood and would provide 11.8 acres (4.8 hectares) of publicly accessible open space, although this is assumed to be all passive space under the Museum Alternative. This alternative would require a rezoning, proposed here to be C2-6, of the hospital campus area to permit museum/exhibition uses.

As-of-Right Alternative

The As-of-Right Alternative is a maximum-build scenario under the existing M3 zoning. Only four of the principal buildings would be retained; the remainder would be demolished to make way for the substantial increment of industrial space that zoning permits. The historic campus area would be redeveloped, with significant adverse impact on the historic resources of the site. Only the 1.7-acre (0.7-hectare) cemetery would be retained and provide a passive open-space resource.

S.3.2 Socioeconomics

No Action Alternative

Under this alternative, there would be no redevelopment at the base and hence no new jobs, earnings, or tax revenues would be generated, and there would be no provision of community facility assets, such as open space.

Reuse Plan

The proposed Reuse Plan would introduce some 1,630 new industrial, commercial, and institutional jobs to the community. This increment is unlikely to stimulate any discernable demographic changes or generate any in-migration to the city. Table S-2 summarizes the employment, earnings, and revenue implications of the Reuse Plan and its action alternatives.

Estimated earnings of these new workers would be $45.7 million per year in 1998 dollars. Secondary economic activity and indirect employment are estimated at 872 jobs with almost $24 million in earnings. Based on estimated construction costs of about $18.5 million, direct construction employment is projected to provide approximately 141 person-year jobs, spread over the build period. Indirect employment generated by the construction spending is estimated at 76 jobs. Total earnings from the direct construction jobs are estimated at $6.3 million, and for indirect jobs at $2.3 million.

While no new real property taxes are anticipated from the Reuse Plan because the site would be city-owned, new personal and corporate income taxes, and sales taxes would provide the state with total annual revenues of almost $4.5 million and the city $3.8 million from the permanent operations under the Reuse Plan. These new revenues would represent approximately 0.007 percent of the state budget and 0.01 percent of the city budget. Short-term revenues of $533,000 to the state and $452,000 to the city may also be anticipated, spread over the construction period.

Residential Alternative

Compared to the Reuse Plan, the Residential Alternative is a less-intensive alternative and reduces the number of projected new employees to 1,050 but would add an estimated 94 households, or 235 persons, at the site. The total annual earnings of the projected direct employment would be $29.6 million, with indirect employment accounting for an additional 647 jobs with $12.8 million earnings. Total renovation costs would be estimated at $18.5 million, the same as for the Reuse Plan. In consequence, the direct and indirect construction employment and earnings would also be the same as with the Reuse Plan.

Table S-2

Socioeconomic Impacts of the Reuse Plan and its Alternatives

Category	Reuse Plan	Alternatives		
		Residential	Museum	As-of-Right
Direct Employment	1,630	1,050	1,118	5,000
Indirect Employment	872	647	664	2,575
Subtotal	2,502	1,697	1,782	7,575
Total Earnings ($ millions)	69.7	42.3	46.7	207.2
Construction Cost ($ millions)	18.5	18.5	18.5	238.7
Construction-related Direct Employment	141	141	141	1,821
Construction-related Indirect Employment	76	76	76	978
Construction-related Employment Subtotal	217	217	217	2,799
Total Construction-related Earnings ($ millions)	8.6	8.6	8.6	111.0
New Tax Revenues from Operations				
NY State	4.5	3.2	2.8	13.2
NY City	3.8	2.7	2.3	10.8

As with the proposed Reuse Plan, the Residential Alternative would generate substantial fiscal benefits from the development of NAVSTA Brooklyn. The residential component may generate new real property taxes, but because of tax abatement/exemption programs is unlikely to benefit for 12 to 20 years. Projected revenues from personal and corporate incomes taxes and sales taxes indicate that the state could anticipate about $3.2 million per year from the Residential Alternative, plus an additional $533,000 during the construction phase. For NYC, this alternative is estimated to generate $2.7 million per year, plus an additional $452,000 during the construction phase.

Museum Alternative

The Museum Alternative anticipates direct employment at 1,118 jobs, with earnings estimated at $32.7 million. There would also be a substantial visitor population, estimated at 200,000 per year. Indirect employment is estimated at 764 jobs, with $14 million in earnings. Total construction costs for the Museum Alternative are estimated at $18.5 million, similar to those of the Reuse Plan; consequently, direct construction jobs/earnings and other indirect jobs/earnings would also be the same as the Reuse Plan.

As with the Reuse Plan, there would be no property taxes generated from the Museum Alternative because the museum is expected to be a tax-exempt, not-for-profit facility. Other new revenues would provide the state with about $2.8 million per year from the various income and sales taxes, and NYC with almost $2.3 million per year.

As-of-Right Alternative

This alternative maximizes the buildout of the site under existing zoning, and represents the most intensive of the alternatives analyzed. Direct employment at full buildout is projected at 5,000, with associated earnings of over $149.5 million. Total indirect employment is estimated at 2,574, with earnings of $58 million.

Construction costs are estimated at $238.7 million, generating an estimated 1,821 direct construction jobs and 978 indirect jobs over the construction period. Earnings for the construction phase are estimated at $82 million for direct employment and $29 million for indirect employment.

Substantial new revenues would be derived from the direct and indirect employment and the associated earned income, corporate income, and sales taxes. The state is projected to receive almost $13.2 million per year from the various income and sales taxes plus $6.9 million during the construction phase. For NYC, this alternative is estimated to generate $10.8 million per year, plus $5.8 million during the construction phase.

S.3.3 Community Services

No Action Alternative

There would be no redevelopment at the base under the No Action Alternative; thus, there would be no new demand created for community services.

Reuse Plan

The Reuse Plan would introduce no new residents to the area; consequently, there would be no new demands placed on neighborhood schools or other services oriented toward resident populations. NYC Police and Fire Departments anticipate no problems in meeting the service needs of the new industrial, commercial, and community facilities proposed for the site.

The Reuse Plan proposes the development of new, as-yet unspecified community facilities but anticipates these could be a day-care center, health center, job-training center, school, or institutional offices, thereby providing a notable increment to this type of facility in the community. In addition, substantial new park facilities totaling 11.8 acres (4.8 hectares) would be provided, noticeably improving user/space ratios in the community.

Residential Alternative

The Residential Alternative would reuse the hospital campus buildings for residential use, providing an estimated 94 dwelling units. These new households are likely to generate about nine new pupils, distributed: one to high school; three to intermediate school; and five to elementary school. The Residential Alternative would thus have very modest impacts on local schools, most of which are well below capacity.

NYC Police and Fire Departments anticipate no problems in meeting the service needs of the new industrial, commercial, and residential facilities proposed for the site. This alternative provides only a small increment to open-space resources, assuming only the 1.7-acre (0.7-hectare) cemetery area to be provided as publicly accessible passive space.

Museum Alternative

The Museum Alternative is similar to the Reuse Plan, but would generate fewer employees and more visitors to the site. There would be no residents. NYC Police and Fire Departments anticipate no problems in meeting the service needs of the new industrial and museum/exhibition facilities proposed for the site. Substantial new publicly accessible open-space resources, totaling 11.8 acres (4.8 hectares), would be provided, thereby improving user/space ratios in the community.

As-of-Right Alternative

The As-of-Right Alternative would generate approximately 5,000 new workers at the site and no new residents. NYC Police and Fire Departments anticipate no problems in meeting the service needs of the proposed new industrial facilities. This alternative provides a small increment to open space resources, as only the 1.7 acre (0.7 hectares) cemetery area would be provided as publicly accessible passive space.

S.3.4 Transportation

In order to compare future no action traffic volumes to projected traffic volumes associated with the reuse of NAVSTA Brooklyn, traffic counts were collected at 15 locations in July 1997. Trip generation rates were derived for specific uses from the Institute of Transportation Engineers (ITE, 1997). Table S-3 shows trips generated during am and pm peak periods and total daily trips for the NAVSTA Brooklyn reuse alternatives.

Table S-3

Generated Vehicle Trips

Time Period	Reuse Plan	Residential Alternative	Museum Alternative	As-of-Right Alternative
AM	1,440	1,151	549	1,960
PM	1,437	1,088	510	2,095

No Action Alternative

Future traffic volumes under the No Action Alternative were estimated based on traffic conditions measured in 1997 and changes in the study area's traffic generators likely by the build year of 2002. An annual growth rate of one percent per year was used to account for general traffic growth in the area. The street network was assumed to remain similar to existing conditions except for minor signalization improvements. Findings indicated that the majority of intersections would have overall level of service (LOS) at B or better. However, two intersections would operate at LOS C (Williamsburg Street West/Flushing Avenue in the pm peak and Classon Avenue/Flushing Avenue in the am peak), and two intersections would operate at LOS F (Park Avenue/Classon Avenue in both the am and pm peaks, and Flushing Avenue/Navy Street in the pm peak); these locations operate at LOS F under existing conditions.

Reuse Plan

Implementation of the Reuse Plan would generate 1,440 trips in the am peak and 1,437 trips in the pm peak. Capacity analysis of the 15 intersections indicated that overall operation at most of the intersections remains acceptable (LOS C or better), although certain lane-group movements would experience increased delay. Three intersections would experience significant impacts:

- Williamsburg Street West and Flushing Avenue (am and pm peak);
- Classon Avenue and Flushing Avenue (am and pm peaks); and
- Flushing Avenue and Clinton Avenue (pm peak).

Modifications to the signal timing were investigated as potential mitigation measures at these locations. Under such action, traffic conditions would improve to acceptable levels at Williamsburg Street West and Flushing Avenue. Conditions at Classon Avenue and Flushing Avenue would improve to acceptable levels in the pm peak, and within a few seconds of LOS C in the am peak. It is important to note the close proximity of these two locations, and the necessary coordination of the two signals to achieve the predicted improvements. At Flushing Avenue and Clinton Avenue, a signal timing adjustment improves the overall operation of the intersection from LOS D to LOS B in the pm peak.

Residential Alternative

The Residential Alternative incorporates land use components similar to those of the proposed Reuse Plan, but it features residential use of the hospital campus area and less public open space. The Residential Alternative would generate fewer vehicle trips than the Reuse Plan; therefore, impacts of this alternative would be less. However, the three locations noted as significantly impacted under the Reuse Plan would also be so under this alternative. Mitigation measures would be as described for the Reuse Plan.

Museum Alternative

The Museum Alternative also involves a less-intensive development of the site than the Reuse Plan, despite the 200,000 annual visitors attributed to the museum, as shown in Table S-3. The impact on intersections would not be very different than the Reuse Plan. Mitigation measures would be as described for the Reuse Plan.

As-of-Right Alternative

The As-of-Right Alternative would generate a higher number of additional trips to the site than the Reuse Plan. The number of trips in the am and peak hours would increase, as shown in Table S-3. Impacts of this alternative would be more substantial than those described for the Reuse Plan. Mitigation measures would be the same as described for the Reuse Plan.

S.3.5 Air Quality

Air quality analyses of traffic-related carbon monoxide (CO) impacts were conducted for the Reuse Plan and its alternatives. Average hourly CO concentrations were predicted for the peak am and pm one-hour traffic periods using an air-pollutant dispersion model (USEPA's CAL3QHC) applied to seven intersections determined on the basis of traffic analysis as likely to experience the maximum changes in future traffic patterns.

No Action Alternative

Analysis of future no action conditions in year 2002 indicated no mobile source emission violations of the National Ambient Air Quality Standards (NAAQS) CO one-hour standard of 35 parts per million (ppm) and the eight-hour standard of nine ppm for both am and pm peak periods under the No Action Alternative. No exceedances of the NAAQS due to off-site major sources were predicted on-site.

Reuse Plan and Residential, Museum, and As-of-Right Alternatives

The results of the microscale air-quality analysis for the Reuse Plan and its alternatives show no violations of the NAAQS CO one-hour standard of 35 ppm and eight-hour standard of nine ppm. While CO levels would be higher under the Reuse Plan and its alternatives than with the No Action Alternative at all locations due to increased traffic, the increases would not be significant.

The long-term impact on air quality from stationary emission sources, including heating units, would depend upon the nature and extent of the activities conducted on the property. The NYS Department of Environmental Conservation (DEC) would have jurisdiction over these emission sources, and it would be necessary for all such sources to comply with agency standards. Certain sources would require appropriate permits from the NYSDEC.

Air quality impacts from construction activity would be from fugitive dust on-site and mobile source emissions from construction vehicles, equipment, and workers' automobiles. The former would be mitigated easily by using water to control the dust during demolition and construction; mobile source emissions are construction activity-specific, not significant, and short-term.

S.3.6 Noise

Ten locations in the study area were monitored for existing conditions and modeled for the No Action Alternative, Reuse Plan, and the other action alternatives. Under NYC standards, a three-dBA or greater increase in noise levels is considered an indicator of a significant noise impact that becomes perceptible to most listeners.

No Action Alternative

There would be an increase in noise under no action conditions as there would be general traffic growth in the region (a growth rate of one percent a year is assumed). All increases in noise levels from existing conditions to No Action Alternative conditions would be less than or equal to one decibel.

Reuse Plan

There would be no increase of three dBA or greater in traffic noise levels at all monitoring sites, except Site 7 during the am peak period. Site 7, a playground located on Flushing Avenue near the BQE, would experience a 3.2 dBA noise increase due to traffic merge near the site, this is considered a significant increase under NYC noise standards.

Stationary noise sources, such as exterior mechanical equipment, would be designed to comply with applicable ordinances. There would be no significant impact from these sources. Noise generated by construction activity would be restricted to the daytime, would be finite in nature, and would not have any significant impact.

Residential and Museum Alternatives

In general, future mobile source noise impacts associated with the these two alternatives would be at levels similar to those for the Reuse Plan, although somewhat lower given the slightly reduced level of trip generation. No increase of three dBA or greater would occur at any monitoring site. However, existing high noise levels generated by the adjacent Brooklyn Queens Expressway would have a negative impact on the residential use of the site if the Residential Alternative were selected.

As-of-Right Alternative

Future mobile-source noise impacts associated with the As-of-Right Alternative would be at similar levels to the Reuse Plan, but generally higher given the greater amount of daily trip generation. A perceptible noise increase was predicted for Site 7 during the daytime periods.

Stationary source noise under this alternative would be similar to the above-described alternatives.

Construction noise would be more significant under this alternative because of the substantial new construction anticipated. However, such noise would be most significant during the early phases of this work and would be of relatively short duration, and would comply with local noise ordinances.

S.3.7 Infrastructure

Infrastructure involves such systems as electricity, steam production, potable and non-potable water, wastewater, stormwater, solid waste, and other utilities.

No Action Alternative

Under the No Action Alternative there would be no redevelopment at the base; thus, little or no new demand would be created for utilities.

Reuse Plan and Residential, Museum, and As-of-Right Alternatives

In the case of infrastructure, existing conditions and projected impacts would be similar for each of the four action alternatives.

- **Electricity** – would continue to be provided by Con Edison; further analysis would be required to address gradual replacement and upgrade of the distribution system based on actual implementation requirements.

- **Steam production** – anticipated to be ample for all alternatives; however, only buildings in the western industrial sector presently receive steam and the remainder of the site's distribution system may require replacement.

- **Gas** – natural gas would continue to be provided by Brooklyn Union. No problems are anticipated in providing ample gas to the uses proposed under each of the alternatives. However, the widespread new construction anticipated under the As-of-Right Alternative would be likely to require relocation of existing gas lines.

- **Water supply** – potable water is supplied to the site by the NYC distribution system. There are no anticipated problems in meeting the needs of the various alternatives; however, the extent of on-site leaks is unknown. The need to upgrade the system would have to be determined by the ultimate developer of the property.

- **Wastewater system** – according the NYCDEP, the NAVSTA Brooklyn sewer system is in poor condition (City of New York, 1996). The sewer system would need to be brought up to city regulatory standards under any reuse or new construction plan. The upgrading of the sewer system would be the responsibility of the ultimate developer of the property.

S.3.8 Cultural Resources

In 1994, the Navy completed the *Cultural Resources Survey For Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York, Brooklyn, NY*, an intensive-level cultural resources survey of the NAVSTA Brooklyn site in accordance with SHPO comments of 1992. The survey conducted building evaluations according to the Secretary of the Interior's Criteria for Historic Significance (36 CFR 60.4). In addition to the two NYC-landmarked structures (the Naval Hospital and the Surgeon's House) that were determined individually eligible for the National Register, the survey identified two historic districts comprising NAVSTA Brooklyn:

- The Naval Hospital campus, defined as a district eligible for the National Register by the SHPO in 1992, was further evaluated as a coherent cluster of 19th- and 20th-century residential, institutional, and industrial buildings associated with one of the nation's oldest Naval installations; and

- The former Brooklyn Navy Yard (Naval Shipyard) district includes those areas of NAVSTA Brooklyn more closely identified with the Navy Yard than the hospital; i.e., the northern triangle, western industrial sector, and the BQE frontage. Buildings here are mostly associated with WWII expansion and retain their integrity as maritime and industrial buildings associated with the former Naval Shipyard.

Two archaeological sites contributing to these historic properties were identified in studies performed after the 1994 survey. One archaeological resource, the Naval Hospital cemetery, contributes to the hospital historic district. The second archaeological resource surrounds and contributes to the individually eligible Naval Hospital building.

No Action Alternative

Under the No Action Alternative the Navy would not dispose of NAVSTA Brooklyn, and no new construction or alteration of structures would occur. The NAVSTA Brooklyn facilities have been closed in accordance with Naval Facilities Engineering Command (NAVFACENGCOM) standards and procedures for mothballing facilities. No adverse effects would be anticipated.

Reuse Plan and Residential and Museum Alternatives

For cultural resources, existing conditions and projected impacts are similar for the Reuse Plan and the Residential and Museum Alternatives. The disposal of the property by the Navy would constitute an adverse effect and would require the execution of a Programmatic Agreement identifying required mitigation with the NY SHPO. The subsequent reuse of the property under the Reuse Plan and the Residential and Museum Alternatives would result in similar effects because they propose the adaptive reuse of buildings for various combinations of industrial, commercial, residential, and institutional purposes, with no new construction. Under all three alternatives, the two individually

eligible historic buildings would be retained and reused. If the adaptive reuse of all historic buildings is conducted in accordance with the *Secretary of Interior's Standard's for Rehabilitation*, no adverse effects would be anticipated (United States Department of the Interior [USDOI], 1992; 36 CFR 800.9[c]2).

Demolition of contributing structures to the historic districts also could occur. If additional demolition of contributing buildings occurs, adverse effects to the historic districts would result. If fences or other barriers are erected that conform to the existing street pattern and are of materials that harmonize with existing brick and stone perimeter walls, they would have no adverse effect on the historic districts.

As-of-Right Alternative

The As-of-Right Alternative retains the two individually eligible NYC-landmarked structures, together with the industrial lab and foundry buildings; all other structures would be demolished to provide for new industrial/warehouse structures and required parking and circulation. The cemetery area would be retained as open space but all other open space areas could be developed under this alternative. If the adaptive reuse of the two historic buildings is conducted in accordance with the *Secretary of Interior's Standard's for Rehabilitation*, no adverse effects on these two structures would be anticipated. However, the demolition of the other contributing buildings to the historic district would result in significant adverse effects.

S.3.9 Natural Resources

There are no records of any federal- or state-listed endangered or threatened species at the NAVSTA Brooklyn site. No wetlands occur on the site, although approximately one acre (0.4 hectares) in the northeast of the site appears in Zone B (between 100-year and 500- year flood) on the National Flood Insurance Program's Flood Insurance Rate Map (FIRM). There are no streams, creeks, ponds, or lakes on the site, and the site is not located on the aquifer system of Long Island.

No Action Alternative

Under the No Action Alternative, existing natural resources would remain unchanged. The majority of the site would remain filled and paved and continue to be of limited value with regard to natural resources.

Reuse Plan and Residential and Museum Alternatives

Potential impacts to natural resources resulting from implementation of these alternatives are similar, as follows:

- Biological Resources – The site would continue to provide limited habitat for wildlife. There are no threatened and endangered species or their habitats at the site.

- Wetlands and Floodplains – There are no wetlands at the NAVSTA Brooklyn site and, as no new construction would take place, there would be no adverse impact to the floodplain.

- Water Resources – There would be no impacts on groundwater and the site would continue to draw water from New York City. No impacts to surface water would occur.

- Topography, Geology, and Soils – There would be no impacts to topography, geology, and soils.

As-of-Right Alternative

The As-of-Right Alternative proposes a maximum buildout of the site; thus, potential effects to the following natural resources differ from those of the other alternatives:

- Biological Resources – The only open space that would remain is the 1.7 acre (0.7 hectare) of land that is occupied by the cemetery; however, this loss of open space would not present a significant impact to wildlife because the undeveloped areas are currently of low wildlife value.

- Wetlands and Floodplains – A small portion of the site lies within the 500-year floodplain. If construction activities were to take place within this area all structures would conform to Federal Emergency Management Agency (FEMA) floodplain standards. There are no wetlands at NAVSTA Brooklyn.

- Topography, Geology, and Soils – A soil and erosion control plan would be developed and adhered to for significant construction projects that involve earthmoving activities. Much of NAVSTA Brooklyn is located on filled land where the original soils have been greatly disturbed; thus, there would be no impact to topography, geology, and soils.

S.3.10 Petroleum and Hazardous Substances

As a result of past waste- and resource-management practices at NAVSTA Brooklyn, some areas were impacted by various hazardous materials and wastes. While no Installation Restoration Program (IRP) sites have been identified at NAVSTA Brooklyn, portions of the site were identified by the

NYSDEC as confirmed inactive hazardous waste disposal sites subject to the State of New York Superfund Program (BRAC Cleanup Team et al., February 1996).

Compliance activities at NAVSTA Brooklyn have related to underground storage tanks (USTs), lead-based paint (LBP), polychlorinated biphenyls (PCBs), and asbestos. A project to remove inactive or out-of-compliance tanks was completed in 1994. Abatement of LBP hazards began in 1995 and was completed in 1996. There are currently no PCB or PCB-contaminated transformers at NAVSTA Brooklyn. Abatement of friable, accessible, and damaged (FAD) asbestos at NAVSTA Brooklyn began in 1994 and was completed in 1995 in the non-residential areas and in 1996 in the residential areas. Site investigations and cleanup actions at NAVSTA Brooklyn have been completed, which resulted in NYSDEC delisting areas of NAVSTA Brooklyn as inactive hazardous waste sites in December 1997.

No Action Alternative

Under the No Action Alternative, the Navy's use of hazardous materials would continue to be limited to the need to satisfy caretaker functions, since NAVSTA Brooklyn was operationally closed in 1993. Environmental cleanup activities at NAVSTA Brooklyn have been completed.

Reuse Plan and Residential, Museum, and As-of-Right Alternatives

Site investigations and cleanup actions at NAVSTA Brooklyn have been completed, which resulted in NYSDEC delisting areas of NAVSTA Brooklyn as inactive hazardous waste sites in December 1997. The Navy has completed the removal of FAD ACM prior to property transfer; however, some ACM would remain. Therefore, subsequent renovations requiring the removal of ACM would have to be performed in accordance with all applicable New York City, New York State, and federal regulations. Notification of the presence of ACM would be incorporated into the deed.

Abatement of LBP exposure was completed in the former residential structures and dwellings in 1996. Reuse of nonresidential structures for community or residential use would require sampling, abatement, and worker and building occupant protection in accordance with all applicable city, state, and federal regulations. Notification of the presence of LBP would be incorporated into the deed.

New industries and businesses locating to the site may use some hazardous materials and/or generate some petroleum and/or hazardous substances; the types and amounts of these materials cannot be specified at this time, as the actual future tenants are not known. These tenants would need to comply with appropriate federal, state, and local regulatory agencies regarding the use and generation of hazardous materials or wastes. Any reuse, modification, renovation, and/or demolition of buildings would have to address the issues of LBP and asbestos.

S.3.11 Cumulative Impacts of the Preferred Action

Cumulative impacts to the study area as a result of the redevelopment of NAVSTA Brooklyn under the preferred action (the Reuse Plan) would include the development of an estimated 1,630 industrial, commercial, and community/institutional jobs accommodated in the existing structures on site. These activities would be in accord with historic uses of the site. Implementation of the Reuse Plan is not anticipated to create induced development impacts in the surrounding community.

Interviews with the NYC Department of City Planning (DCP), Brooklyn Office, in 1997 and 1998 indicated that few projects are planned in the study area. The most significant project identified by DCP is in the Williamsburg I Urban Renewal Area (site 5A at Kent Avenue near Clymer Street), where a private developer plans to build approximately 150 units of housing, in part using the shell of an existing building. Another residential project under construction between Flushing Avenue and Wallabout Street involves 75 units. DCP also identified a proposal to develop a helicopter-repair facility on Pier G in the BNYDC-controlled Navy Yard. This activity would not involve passenger service.

Another project that has very recently been proposed for the BNYDC-controlled Navy Yard is a movie studio with 400,000 sq ft (37,160 sq m) on a 15-acre (6.1-hectare) parcel to the northwest of NAVSTA Brooklyn. This project is speculative and its potential activity has not been factored into the traffic and other analyses included in this document. Other development projects in the area are relatively small and are included within the background growth factors used in the traffic analysis or demographic projections for the area.

S.4 Relationship of Proposed Action to Federal, State, and Local Plans, Policies, and Controls

The Reuse Plan is generally consistent with relevant federal, state, and local plans, policies, and controls, assuming that the reuse of buildings with asbestos and LBP is achieved in accordance with regulations, and historic mitigation is performed in accordance with applicable guidance and standards. The Reuse Plan would not cause adverse environmental or economic impacts specific to any groups or individuals from minority or low-income populations; additionally, no persons would be displaced with the proposed transfer and reuse.

S.5 Unavoidable Adverse Effects, Relationship Between Local Short-term Uses and Enhancement of Long-term Productivity, and Irreversible and Irretrievable Commitments of Resources

The additional vehicular traffic generated by the Reuse Plan would create a deterioration of service levels at two nearby signalized intersections. Potential mitigation would return them to acceptable levels with the exception of one intersection in the am peak, which would be slightly below acceptable levels. Noise level increases would be perceptible at one of ten monitoring sites (a playground near the BQE interstate at Flushing Avenue).

Proposed disposal of NAVSTA Brooklyn would adversely affect cultural resources. However, these effects would be mitigated by implementation of the *Secretary of Interior's Standards for Rehabilitation.*

Irreversible and irretrievable commitments of resources would be made in terms of the commitment of resources (construction materials) to the proposed building renovations, and the long-term use of resources, such as energy supply, water, sewage treatment, landfill capacity, and road use. On balance, the proposed Reuse Plan is considered a productive use of the property that does not negatively impact the site's potential for long-term productivity (e.g., in terms of economics, induced population, etc.).

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ACM	asbestos-containing material
AMSL	above mean sea level
ANSI	American National Standards Institute
BCP	Base Realignment and Closure Cleanup Plan
BEA	Bureau of Economic Analysis
bld	billion liters per day
Bldg(s)	Building(s)
BLS	Bureau of Labor Statistics
BNYCP	Brooklyn Navy Yard Cogeneration Plant
BNYDC	Brooklyn Naval Yard Development Corporation
BPIP	Building Profile Input Program
BQE	Brooklyn-Queens Expressway
BRAC	Base Closure and Realignment Act
BUMED	Bureau of Medicine and Surgery
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CCPO	Consolidated Civilian Personnel Office
CEPO	City Environmental Protection Order
CEQ	Council on Environmental Quality
CEQR	City Environmental Quality Review
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
cm	centimeter
CO	carbon monoxide
COE	Corps of Engineers (US Army)
Con Ed	Consolidated Edison Company
dB	decibel
dBA	decibel (A Scale)
DCP	Department of City Planning
DEIS	Draft Environmental Impact Statement
DNL	day-night average sound level
DoD	Department of Defense
DoN	Department of the Navy

LIST OF ACRONYMS

EBS	Environmental Baseline Survey
ECL	Environmental Conservation Law
EDC	Economic Development Corporation
EIS	Environmental Impact Statement
EO	Executive Order
FAD	friable, accessible, and damaged
FAR	floor area ratio
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIC	Federal Interagency Committee
FONSI	Finding of No Significant Impact
FOST	Finding of Suitability to Transfer
ft	foot (feet)
FY	Fiscal Year
GEP	Good Engineering Practice
GPR	ground-penetrating radar
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HHS	Department of Health and Human Services
HUD	Department of Housing and Urban Development
I/O	input/output matrix
in	inch
IRP	Installation Restoration Program
ISCST3	Industrial Source Complex Model
ITE	Institute of Transportation Engineers
IWG	Interagency Working Group
km	kilometers
kv	Kilovolts
kw	Kilowatts
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LBP	lead-based paint
LOS	level of service
LRA	local reuse authority
LWRP	Local Waterfront Revitalization Program

LIST OF ACRONYMS

m	meters
mi	miles
MMBTU	million British Thermal Units
MOA	Memorandum of Agreement
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NAVFACENGCOM	Naval Facilities Engineering Command
NAVSTA	Naval Station
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NISRA	Naval Investigative Service Resident Agent
NMPS	Naval Motion Picture Service
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWS	National Weather Service
NYC	New York City
NYCDEP	New York City Department of Environmental Planning
NYCRR	New York City Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSM	New York State Museum
O_3	ozone
OEC	Office of Environmental Coordination
OPNAVINST	Chief of Naval Operations Instruction
OSR	open space requirement
PA	Programmatic Agreement
Pb	lead
PCB	polychlorinated biphenyl
PILOT	Payment in Lieu of Taxes
PL	Public Law
PM	particulate matter
ppm	parts per million
PSD	Personnel Support Activity Detachment

LIST OF ACRONYMS

RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RCRY	Rules of the City of New York
RI	Remedial Investigation
RIMS	Regional Input/Output Model System
ROICC	Resident Officer in Charge of Construction
RONA	Record of Non-applicability
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SEC	Supportive Employment Center
SEL	sound exposure level
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Officer
SICC	State Industrial Classification Codes
SIP	State Implementation Program
SO_2	sulfur dioxide
sq ft	square feet
sq m	square meters
SUPSHIPS	Supervisor of Shipbuilding, Conversion and Repair
TAGM	Technical and Administrative Guidance Memorandum
TAMS	TAMS Consultants, Inc.
TSCA	Toxic Substances Control Act
TSP	total suspended particulates
ULI	Urban Land Institute
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
V/C	volume/capacity ratio
vpd	vehicles per day
vph	vehicles per hour
WRP	Waterfront Revitalization Plan

1 PURPOSE AND NEED

As directed under PL 100-526, the Navy has closed Naval Station (NAVSTA) Brooklyn, located in Kings County (borough of Brooklyn) in New York City (NYC) (Figure 1-1, Site Location) and now plans to dispose of this facility. The NAVSTA Brooklyn site is comprised of the Hospital Annex and three portions of the adjacent Brooklyn Naval Shipyard (Navy Yard). The major part of the Navy Yard, with its dry docks and industrial facilities, was conveyed to the City of New York in 1966 and presently functions as an industrial park managed by the Brooklyn Navy Yard Development Corporation (BNYDC), a subsidiary of the NYC Economic Development Corporation (EDC).

NAVSTA Brooklyn covers 28.8 government-owned acres (11.7 hectares). Until its closure in 1988, NAVSTA Brooklyn had functioned as the administrative headquarters of NAVSTA New York, which at that time was comprised of five sites on Long Island and Staten Island. With the development of the Navy Homeport on Staten Island and the realignment of Navy facilities required by Congress, the NAVSTA command was relocated to Staten Island in 1988.

The NAVSTA Brooklyn site has been under the ownership of the Navy for over 170 years and was part of the Brooklyn Naval Shipyard established in 1801, which acted as a primary shipbuilding and repair facility supplying sail-powered, steam-powered, and iron-clad warships to the Navy. During World War II the Navy Yard, at its peak, employed 70,000 personnel, constructed three battleships and four aircraft carriers, repaired more than 5,000 ships, and converted 250 ships.

This Environmental Impact Statement (EIS) has been prepared in accordance with:

- The National Environmental Policy Act (NEPA) of 1969 (PL 91-190; 42 USC 4321 et seq.);
- The Council on Environmental Quality (CEQ) Regulations on Implementing NEPA Procedures (40 Code of Federal Regulations [CFR] 1500-1508); and
- The Environmental and Natural Resources Program Manual, Chief of Naval Operations Instruction (OPNAVINST) 5090.1B.

Although the Navy, as a federal agency, is not required to comply with the NYC Environmental Quality Review (CEQR) procedures (Executive Order [EO] 91 [43RCNY 6-01 et seq., Appendix A]; 62 RCNY, Ch. 5 [1991]), this EIS has also been prepared pursuant to CEQR. CEQR provides for the determination of the need for environmental review by a "lead agency" and the review by other involved and interested agencies in the scoping and findings of the draft EIS (DEIS). When the DEIS is certificated as complete by the lead agency, a public hearing is held on the DEIS. A final EIS (FEIS) is then prepared and a notice of completion issued. If project involves actions subject to

the NYC uniform land use review procedure (USURP), the eight-month USURP process would begin with the notice of completeness of the DEIS. Actions involved in the implementation of the city's Reuse Plan will require USURP review but the Navy's disposal of NAVSTA Brooklyn does not.

Accordingly, close coordination on EIS preparation has been maintained with the NYC Mayor's Office of Environmental Coordination, as well as the Mayor's Office for Economic Development Planning and Administration (previously known as the Deputy Mayor's Office for Planning and Community Development), the sponsor of the community Reuse Plan.

1.1 Base Closure and Realignment Act

The Base Closure and Realignment Act (known as the BRAC legislation) was signed into law on October 24, 1988 (PL 100-526) and subsequently amended in November 1990 by PL 101-510 (commonly referred to as the BRAC II legislation). The purpose of the BRAC legislation was to provide a fair process for the timely closure and realignment of military installations within the US. The legislation established a nonpartisan Base Closure and Realignment Commissions to review and evaluate military installation closure or realignment recommendations of the Secretary of Defense and to make closure and realignment recommendations to the President and the Congress.

In December 1988, the Base Closure and Realignment Commission recommended that NAVSTA Brooklyn be closed, "...primarily because the support functions located there can be more efficiently and effectively performed at Naval Station New York (Staten Island)" (US Department of Defense [DoD], 1988).

The BRAC legislation also provides certain requirements for compliance with NEPA, including preparation of environmental documentation for actions associated with base closure and realignment. Although the 1988 BRAC legislation did not specify that environmental documentation be prepared for the disposal of any excess federal property, the BRAC II (1990) legislation provided specific direction regarding the relationship between the property disposal process and NEPA requirements.

The BRAC II legislation set forth procedures for the realignment/closure of US DoD installations. It also identified requirements for complying with NEPA, stating that the provisions of NEPA apply:

- During the process of property disposal; and
- During the process of relocating functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected, but before the functions are relocated.

Site Location

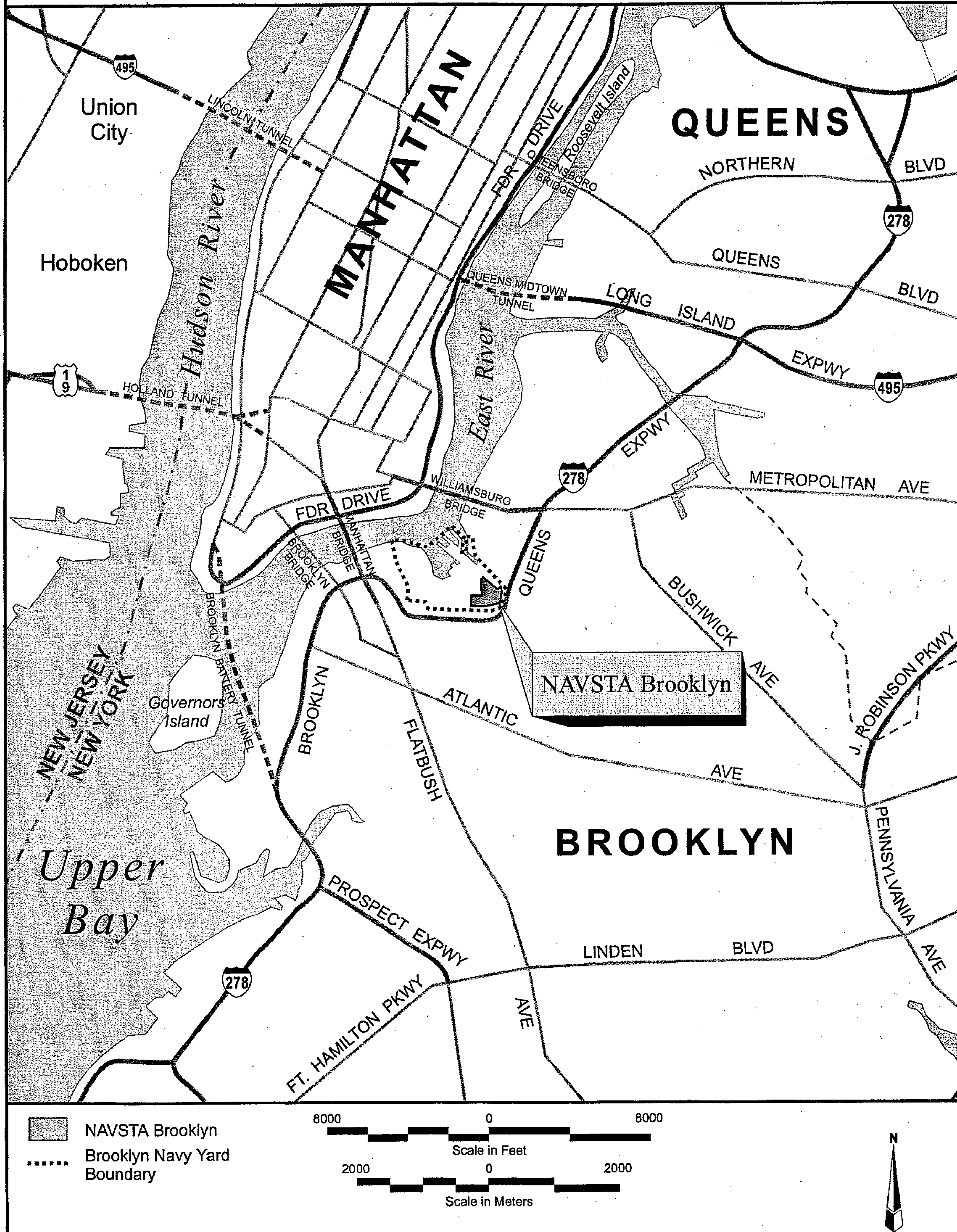

Figure 1-1

However, in applying the provisions of NEPA to the BRAC legislative process, the Secretary of Defense and secretaries of the military departments concerned do *not* have to consider the following concepts (PL 101-510 – November 5, 1993):

- The need for closing or realigning the military installation recommended for closure or realignment by the Base Closure Commission;
- The need for transferring functions to any military installation selected as a receiving installation; and
- Military installation alternatives to those recommended or selected.

Thus, in accordance with the BRAC legislation, this EIS has been prepared to address the probable impacts of the disposal and reuse of NAVSTA Brooklyn.

1.2 Disposal Procedures

The federal government has formal procedures for disposing of its property. Under the specific conditions of BRAC for NAVSTA Brooklyn, the Navy acts as the disposal agency and follows these sequential procedures or screenings:

- First, the Navy offers the property to other DoD agencies and to the Coast Guard;
- If these agencies have no interest, the Navy offers the property to other federal agencies;
- If no federal agency expresses interest in the property, it is advertised for use by agencies serving the homeless, either under the Stewart B. McKinney Assistance Act of 1987 or in accordance with the Base Closure Community Redevelopment and Homeless Assistance Act of 1994 (PL 103-421);
- The property is next offered for sale to state and local governmental bodies and to federally-recognized governments of Indian Tribes. There are discounts, often 100 percent, on the cost if the property is to be used for public benefit, such as for education, parks or recreation, or health-related facilities. Alternatively, property can be acquired through negotiated sale, economic development conveyance, or other authorized disposal methods under BRAC legislation. If a property contains wetlands or is a historic site, the property may be conveyed with deed restrictions on its use to protect these resources; and

- Should state or local governmental bodies or governments of Indian Tribes not want a property or parts of it, the Navy can offer the unwanted property for sale to the general public by competitive bid or auction.

To conform with these procedures, DoD activities, other federal government activities (including consideration of the homeless), and state and local government proposals were screened in order to determine disposal plans.

As a result of the screening process, a portion of the land (approximately five acres [two hectares]) was transferred to the Department of Justice. The remainder of the property was requested by homeless organizations under the Stewart McKinney Homeless Assistance Act. However, as plans were initiated to effect this transfer, the Base Closure Community Redevelopment and Homeless Assistance Act of 1994 (PL 103-421) was passed. This legislation allowed communities undergoing the transfer of a defense installation to satisfy homeless demands through other means, thereby preserving the closed defense installation for economic redevelopment.

The City of New York requested that this new legislation be applied to NAVSTA Brooklyn; subsequently, the Mayor's Office of Planning and Community Relations, acting as the local reuse authority (LRA), prepared a reuse plan for the remaining 28.8 acres (11.7 hectares) of NAVSTA Brooklyn property (*Redevelopment Plan for Naval Station Brooklyn, New York*, City of New York, 1996). The city's Reuse Plan and its alternatives are the subject of this EIS and are described in detail in Chapter 2.

1.3 The NEPA Process

In 1969, the US Congress passed NEPA, our national charter for environmental planning. NEPA provides for the consideration of environmental issues in federal agency planning and decision-making. Guidelines for federal agency implementation of the act were established by the President's CEQ.

NEPA requires federal agencies to prepare an EIS for actions that may significantly affect the quality of the human and natural environment. The EIS must provide full disclosure of significant environmental impacts and inform decision-makers and the public of the reasonable alternatives, including the No Action Alternative.

The first step in the NEPA process is the preparation of a formal Notice of Intent (NOI) to prepare the EIS. The NOI for this project, which was published in the *Federal Register* on January 31, 1997, broadly described the range of alternatives to be considered and the analyses to be conducted for this EIS. The NOI also announced the time and place for public scoping meetings and invited public comment. The scoping meetings were held on February 6, 1997 at the New York City Department

of City Planning, 22 Reade Street, NY, NY, at 10:00 am and at Brooklyn Borough Hall, 209 Joralemon Street, Brooklyn, at 7:00 pm.

Scoping is an early and open mechanism for developing the "scope" of issues to be addressed in the EIS. It also is important for identifying significant or controversial issues related to a proposed action. It is through scoping that the public helps define and prioritize issues of concern and convey these issues to the agency through both oral and written comments. The period for public scoping is generally 45 to 60 days in length.

After scoping, a Draft EIS (DEIS) is prepared. This document provides an assessment of the potential impacts the federal action might have on the human or natural environment. Future environmental conditions with proposed action implementation are compared to current or baseline conditions. The EIS also informs decision-makers and the public of reasonable alternatives, including the No Action Alternative, that would avoid or minimize adverse impacts, or enhance the quality of the environment.

When a DEIS has been completed, the US Environmental Protection Agency (USEPA) publishes a Notice of Availability in the *Federal Register*. The DEIS is subjected to public review during a minimum 45-day public comment period, which typically includes a public hearing. Public comment is sought on a variety of issues, including, but not limited to:

- The range of alternatives considered and their associated impacts;
- Accuracy and completeness of data included in the document; and
- Conclusions reached in the document.

A Final EIS (FEIS) is then prepared that incorporates and formally responds to all public comment received on the DEIS. This response can take the form of corrections of DEIS data inaccuracies, clarifications of and modifications to analytical approaches, inclusion of additional data or analyses, modification of the proposed action or alternatives, or acknowledgment of a comment. The preferred alternative for implementation is identified in the FEIS, if it was not presented in the DEIS. The FEIS is then circulated for public review.

A Record of Decision (ROD) may be issued by an agency not less than 30 days after publication of the FEIS. The ROD establishes the proposed action, describes the public involvement and agency decision-making process, and presents the agency's commitments to mitigation measures. The decision maker may approve a proposal even if it is not the environmentally preferable alternative. Implementation of the proposed action can begin only after the ROD is signed.

Comments on this DEIS should be sent to:

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Head, Environmental Planning Team
US Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, PA 19113

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Fax: (610) 595-0778

2 DESCRIPTION OF THE PROPOSED ACTION

This chapter describes the proposed action and its alternatives. The proposed action is the disposal of NAVSTA Brooklyn and its conveyance to, and reuse by, the City of New York. The City has developed a Reuse Plan that is considered the preferred alternative to be analyzed in this EIS. The regulations of the Council on Environmental Quality (CEQ) emphasize the discussion of alternatives to a proposed action. As defined in Section 1502.14, the analysis of alternatives is the heart of an EIS, the purpose of which is to provide a decision maker and the public with "sharply defined issues and a clear basis for choice among options." The CEQ regulations also direct that other reasonable alternatives to the proposed action must be evaluated in an EIS, even if these alternatives are not within the jurisdiction of the agency.

This chapter includes the following:

- Subchapter 2.1 presents a brief history of the NAVSTA Brooklyn site from its transfer to the Secretary of the Navy in 1824 to the present;
- Subchapter 2.2 presents a discussion of the community reuse planning process, including city development goals and objectives and how potential reuses were screened;
- Subchapter 2.3 describes the Reuse Plan, which is the preferred alternative and is based on the *Redevelopment Plan for Naval Station Brooklyn, New York*, prepared by the City of New York, Mayor's Office for Economic Development Planning and Administration, March 1996;
- Subchapter 2.4 describes the alternatives to be considered:
  - The No Action Alternative;
  - The Residential Alternative;
  - The Museum Alternative; and
  - The As-of-Right Alternative.

The purpose of the alternatives analysis is to represent the full range of alternative development intensities and resulting impacts that might occur with the Navy's proposed action: the disposal of the 28.8 acres (11.7 hectares) of NAVSTA Brooklyn property to the City of New York. By including these alternatives in the EIS, the Navy is not promoting or endorsing any alternative over the community's proposed Reuse Plan; presently, only the preferred alternative has a formal sponsor.

2.1 NAVSTA Brooklyn

NAVSTA Brooklyn has been under the ownership of the Navy for more than 170 years and was part of the Brooklyn Naval Shipyard (Navy Yard) established in 1801. The NAVSTA Brooklyn site (historically also called the "Hospital Annex" or the "Navy Yard Annex") served its neighbor, the Navy Yard, until the Navy Yard was excessed by the Navy in 1966 and disposed of to the City of New York. Under the auspices of the city, the shipyard continues to function as an industrial park known as the Brooklyn Navy Yard.

The NAVSTA Brooklyn site provided support functions to the Navy Yard since the sale of the Schenck farm (about 33 acres [13.35 hectares]) transferred title of the site to the Secretary of the Navy in May 1824. At that time the site was separated from the shipyard by the extensive mudflats known as Wallabout Bay, which were gradually filled during the 19th and early-20th centuries to provide for expansion of the shipyard. The site was selected for the location of the Naval Hospital, and the two-story E-shaped stone building was erected between 1830-38. The Naval Hospital continued in operation until the late 1940s.

By 1850, the hospital grounds were a self-contained entity surrounded by a brick wall with a gatehouse, a cemetery, and a laboratory. In 1864, the Surgeon's House was constructed. Towards the end of the 19th century, a rapid demolition-and-rebuilding program commenced at the site; as a result, by World War I most of the site was covered by medical and support structures. The Hospital Cemetery was closed in 1910 and, in 1926, the Navy exhumed the remains and reinterred them at the National Cemetery at Cypress Hills (Brooklyn). The surface of the former cemetery was regraded and converted to a recreation field in 1944. However, subsequent documentary research indicates that numerous interments were unaccounted for in the 1926 transfers and recent field testing at the site confirmed that burial fragments remain at the cemetery site.

At the height of WW II, over 4,700 patients were admitted to the hospital in the first six months of 1945. Having outgrown its restricted site, the Naval Hospital was decommissioned in June 1948 and its functions transferred to the new Naval Hospital at St. Albans, Queens, NY. Substantial demolition of buildings at the hospital complex occurred, particularly between 1975 and 1985, with the result that 35 buildings, and additional various infrastructure facilities, constructed between 1838 and 1978 remain.

The southwest part of the NAVSTA Brooklyn site was not part of the hospital complex and includes two large industrial structures: the foundry and the laboratory, both built in 1942. The southeast corner of the site (which fronts the Brooklyn-Queens Expressway [BQE]) also accommodated the non-hospital functions of the Motion Picture Office Building, built in 1944. Similarly, the northern triangle was historically associated with the Naval Shipyard.

Through the 1980s, NAVSTA Brooklyn functioned as the administrative headquarters of NAVSTA New York, and the Hospital Annex was used for personnel housing and administrative support. Tenant activities remaining at NAVSTA Brooklyn at that time included:

- Consolidated Civilian Personnel Office (CCPO);
- Resident Officer in Charge of Construction (ROICC);
- Naval Hospital Branch Clinic;
- Naval Dental Branch;
- Naval Investigative Service Resident Agent (NISRA);
- Naval Motion Picture Service (NMPS);
- Personnel Support Activity Detachment (PSD); and
- Supervisor of Shipbuilding, Conversion and Repair (SUPSHIPS).

In 1990, military active duty and civilian personnel at the site were comprised of 17 officers, 135 enlisted persons, and 326 civilians (US Navy, Northern Division 1990). With the development of the Homeport on Staten Island to support the Northeast Surface Action Group (SAG) and the realignment and cost savings required by Congress under the 1988 BRAC legislation, the BRAC commission recommended, in December of 1988, that NAVSTA Brooklyn be closed and that all units located there be transferred to NAVSTA Staten Island. NAVSTA Brooklyn was closed except for ongoing protective services. Building 4, located in the southwest, and a parking area were transferred to the Department of Justice in 1993. The remainder of the site encompasses 28.8 acres (11.7 hectares) and includes 35 buildings, a variety of infrastructure facilities (filling booth, electrical substation, etc.), several recreational amenities (pool, tennis courts), and the Naval Hospital Cemetery.

The NAVSTA Brooklyn site location and building inventory are shown in Figure 2-1 (NAVSTA Brooklyn Site Plan and Building Inventory). Table 2-1 provides the key to the figure with brief descriptions of the buildings, areas, and year built, using the Navy building code number. The site can be broadly divided into four subareas, which are detailed in Table 2-2.

2.2 Community Reuse Plan - Preferred Alternative

This discussion on the reuse planning process for NAVSTA Brooklyn is based extensively on the *Redevelopment Plan for Naval Station Brooklyn, New York* (City of New York, 1996).

Table 2-1

Building Inventory

Navy Building Number	Building Name/Type (Year Built)	Approx. sq ft (sq m)	Historic Building Name
1	Lab Bldg. (1942)	245,146 (22,770)	Materials Testing Laboratory
2	Foundry Bldg. (1942)	118,455 (11,003)	Foundry
3	Guard House (1942)	5,656 (525)	Gate and Guard House
5	Small Office Bldg. (1944)	6,950 (646)	Central Bank
7	Boiler Bldg. (1942)	6,300 (585)	Substation
8	SW Electrical Substation (1942)	1,419 (132)	Substation and Transformer
10	Storage (1942)	3,125 (290)	Public Works Dept. Storage
305	2-Story Office Bldg. (1896)	19,712 (1,831)	Stable
306	Warehouse - Front (1936)	8,364 (777)	Storage and Operations
311	Motion Picture Office Bldg. (1944)	21,583 (2,005)	Motion Picture Exchange
316	Warehouse - Rear (1942)	3,952 (367)	Transportation Maintenance
353	Storage (1938)	300 (27.87)	Storage (?)
671	Pool (1978)	1,250 (116)	Pool
672	Bathhouse (1978)	400 (37)	Bathhouse
RD	Bachelor Enlisted Quarters (1910)	28,536 (2,651)	Laboratory
RG	Bachelor Officers' Quarters (1919)	46,633 (4,332)	Nurses' Quarters
R1	Surgeon's House (1864)	10,984 (1,020)	Surgeon's House
R2, R3	West House, East House (1905)	4,812 (447)	Quarters
R4	3-Story House (1909)	7,852 (729)	Director of Laboratory Quarters
R5, R6, R7	3 Cottages (1915)	2,160 each (201 each)	Contagious Disease Units A, B, and C
R9/R8	Duplex Houses (1926)	2,900 each (269 each)	Bachelor Officers' Quarters

NAVSTA Brooklyn Site Plan and Building Inventory

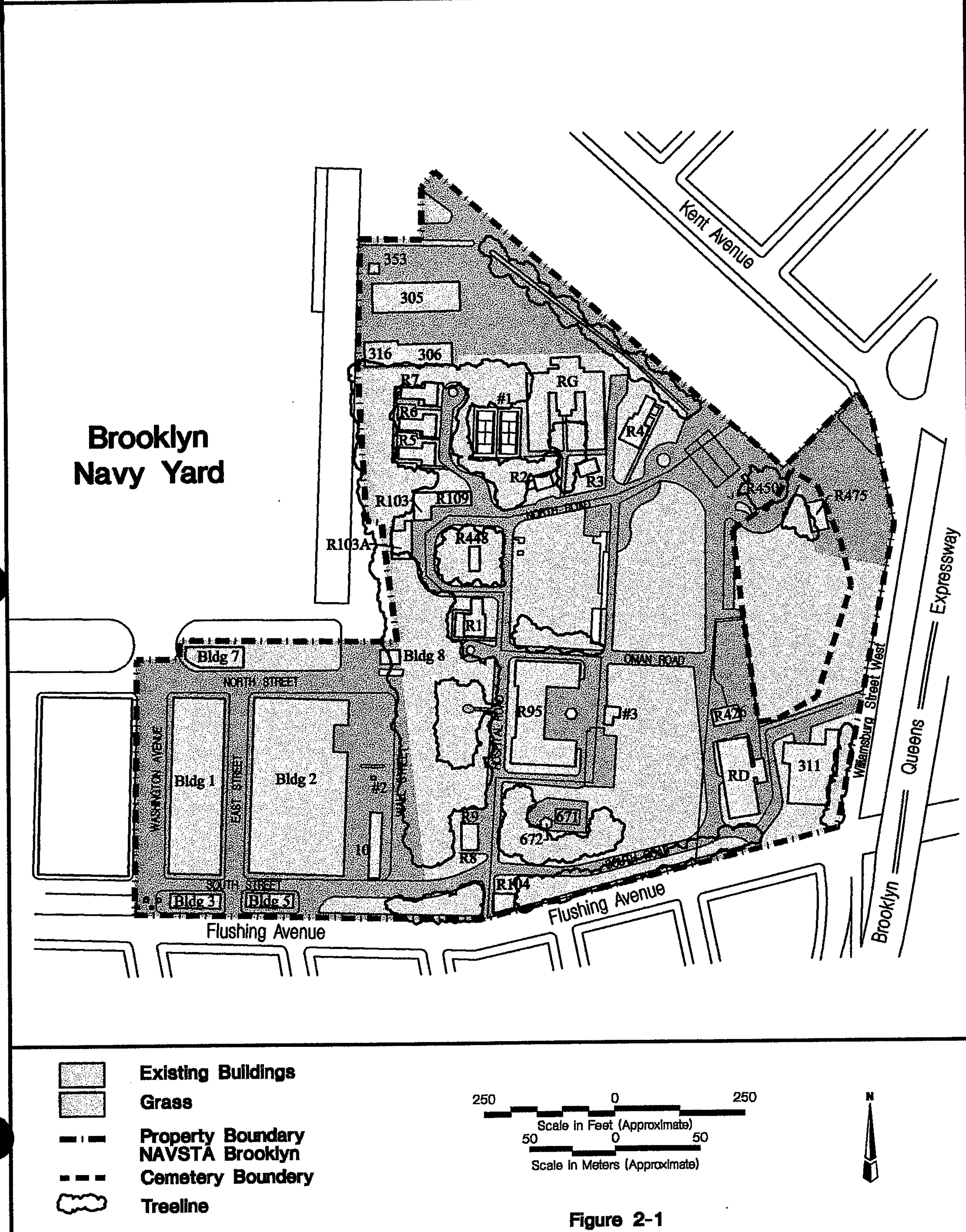


Figure 2-1

Table 2-1, Con't.

Building Inventory

Navy Building Number	Building Name/Type (Year Built)	Approx. sq ft (sq m)	Historic Building Name
R95	Naval Hospital (1830)	48,396 (4,496)	Naval Hospital
R103	4-Car Garage (1894)	3,332 (309)	Carriage House
R103A	1-Story Garage (1943)	2,620 (243)	Garage
R104	Gate House (1850)	1,482 (138)	Guard House and Gate Keeper Lodge
R109	2-Car Garage (1883)	1,716 (159)	Stable
R426	Morgue (1909)	2,409 (224)	Mortuary
R448	Greenhouse (1923)	969 (90)	Greenhouse
R450	NE Electrical Substation (1920)	315 (29)	NE Substation
R475	Service Station (1967)	1,798 (167)	Gas Station
Unlisted (#1)	Tennis Courts (1939)	8,100 (752)	Unknown
Unlisted (#2)	Filling Booth (1975)	49 (5)	Unknown
Unlisted (#3)	Steam Reducing Station (early 1900s)	Unknown dimensions	Unknown
Sources:	*Cultural Resources Survey For Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York, Brooklyn, NY* (US Navy, 1994); *Redevelopment Plan for Naval Station Brooklyn, New York* (City of New York, 1996).		

Table 2-2

NAVSTA Brooklyn Site Subareas

Subarea	Size in Acres (Hectares)	Description
Hospital campus	18.3 (7.4)	Contains the Naval Hospital, which is located on a hill 15 feet (ft) (4.6 meters [m]) above the rest of the site; the Surgeon's House; other various housing; gatehouse; playing fields; and the Naval Hospital Cemetery.
Northern triangle	2.2 (0.9)	Contains two warehouse/office structures located on a lower grade than the hospital campus and more readily associated with the Navy Yard;
Brooklyn-Queens Expressway (BQE) frontage	2.0 (0.8)	This southeast corner of the site, which fronts the BQE, includes the motion picture office building, the Bachelor Enlisted Quarters, and the morgue.
Western industrial sector	6.4 (2.6)	This is a flat, rectangular industrial area containing the site's two largest buildings (i.e., the lab and the foundry) and several small ancillary buildings. This subarea is adjacent and similar in scale to much of the Navy Yard.

2.2.1 City Development Goals and Objectives

Planning Process

The planning process covered a period from spring 1992 to winter 1996. The first phase involved meetings of a city and state interagency task force, under the supervision of a review committee consisting of representatives of the following agencies:

- Mayor's Office of Housing Coordination (as co-lead agency);
- NYC Department of City Planning (NYCDCP);
- NYC Economic Development Corporation (NYCEDC);
- NYS Urban Development Corporation (as co-lead agency);
- NYS Department of Economic Development; and
- NYS Department of Housing and Community Renewal.

The review committee directed a consultant study prepared by Abeles, Phillips, Preiss & Shapiro (APP&S) and others. The consultant team also worked closely with a citizens' advisory committee made up of representatives of the surrounding community, representatives of the City Council, US Congress, the Brooklyn Borough President, two local community boards, and a range of civic and community organizations. Nine meetings were held during the spring and summer of 1992 and

resulted in the consultant report entitled *The Brooklyn Naval Base: A Development Plan* (APP&S et al., 1992). This report proposed a mixed-use redevelopment plan that included a transitional housing shelter, as required under the original McKinney Act (PL 100-77). Subsequently, the Base Closure Community Redevelopment and Homeless Assistance Act of 1994 (PL 103-421) modified the McKinney Act requirements; it was thus arranged for the homeless assistance to be provided off-site.

Between spring 1995 and winter 1996, six planning meetings, a public hearing, and a public information meeting were held. The public hearing (advertised in the *City Record*) was held February 8, 1996 under the auspices of Community Board 2. A draft of the proposed *Redevelopment Plan* was published for review at the February 8 public hearing. This plan was very similar to the original 1992 plan, except that it no longer included the assistance for the homeless component. The area devoted to this element was divided, with the warehouses in the northern triangle being proposed for industrial reuse and the housing structures on the northern part of the part of the hospital campus being included in the park/institutional element. The public information meeting was held by Community Board 1 on February 27, 1996. The official *Redevelopment Plan* was published March 1, 1996.

Goals and Objectives

The citizens' advisory committee presented the following goals to the consulting team:

- Maximize housing opportunities for a mix of income groups in local communities, emphasize "affordable" housing, and accommodate a variety of ethnic populations;
- Create a neighborhood, not a "project," and avoid high-rises;
- Provide economic development opportunities and job training;
- Provide recreational and health-care services for the community, and not a prison or housing intended only for the homeless; and
- Preserve the site's outstanding amenities through the reuse, rather than demolition, of most historic buildings.

Except for the decision that permanent housing be excluded from the redevelopment plan, the Reuse Plan is closely in keeping with the citizens' advisory committee's goals. It provides needed amenities including open space and a place for cultural, educational, or other community institutions; preserves the historic character of the site and individual buildings; and provides substantial opportunities for job development of a kind that will benefit the local community.

2.2.2 Screening of Potential Reuses

Homeless Assistance

The Base Closure Community Redevelopment and Homeless Assistance Act of 1994 (PL 103-421) modified the McKinney Act. This new process allows communities to develop reuse plans that fully accommodate the needs of the homeless as provided under the McKinney Act, while permitting early identification of the remaining property for quick sale for job creation, a federally-sponsored public benefit conveyance, or conveyance to a local redevelopment authority for economic development purposes.

Prior to this new legislation, the city's preferred alternative for the site included direct assistance to the homeless, including a Supportive Employment Center (SEC) for 150 to 200 homeless adults. The SEC was to be a comprehensive employment and housing program providing participants with the skills to become self-sufficient. The revisions in the McKinney Act permit the city to seek an off-site equivalent location for an SEC.

The City of New York has applied to operate under the modified McKinney Act procedure. In 1990, HELP Homeless Service Corporation was designated by the US Department of Housing and Urban Development (HUD), under the stipulations of Title V of the McKinney Act, to develop transitional housing and supportive services for homeless people at NAVSTA Brooklyn. Because HELP is a "prior applicant," the city, as the local reuse authority (LRA), is required to provide HELP with the original property, or off-site properties that are substantially equivalent. To satisfy this requirement, the city has reached agreement with HUD and HELP to utilize the Manhattan Children's Psychiatric Center on Wards Island instead of the NAVSTA Brooklyn site. The Manhattan Children's Psychiatric Center has adequate physical and program space, as well as parking and recreational facilities. Moreover, because it has been in continuous residential use, it is in better condition and can be developed more rapidly and less expensively.

The NAVSTA Brooklyn site was not considered appropriate for a transitional housing facility due to the proximity of a major highway, industrial uses, and a proposed resource recovery facility. Use of NAVSTA Brooklyn for economic development and other community-oriented uses would help to generate jobs and tax revenue for the city and would retain the site's current built environment and reintroduce uses similar to its historic land use pattern.

Permanent Housing

Permanent housing was also considered but rejected for the city's Reuse Plan. Although the surrounding communities of Williamsburg and Fort Greene are in need of new affordable housing, the city eliminated new housing construction and permanent housing at the NAVSTA Brooklyn site because of land use conflicts, zoning incompatibility, historic preservation, and environmental and economic considerations. Any housing plan that could create a meaningful number of housing units

would require extensive new construction that would conflict with the site's outstanding historical amenities and require substantial new infrastructure. Costs of development were considered extremely high, with estimated land development costs alone ranging from $65,000 to $100,000 per unit (APP&S et al., 1992). The site is currently zoned M3 for heavy industrial use, a zoning that prohibits residential uses. A rezoning permitting residential use would require extensive environmental and land use review and, if adopted, could pose problems for existing nearby industrial uses because industrial uses within 300 ft (91 m) of a residential district must meet M1 (light industrial) performance standards.

Municipal Facilities

The city considered but rejected reuse of the site for municipal facilities requiring industrial zoning. The city is in need of sites citywide for locating certain municipal facilities (e.g., sanitation garages, vehicle maintenance facilities, tow pounds, salt storage, etc.). The NYC Department of Parks and Recreation was interested in one of the industrial buildings on the site for its north Brooklyn maintenance facility. However, the Brooklyn Navy Yard is already the site of several municipal facilities (a tow pound and vehicle storage) and was, at the time of consideration, the potential site of a resource recovery facility that has since been eliminated from consideration.

Commercial and Industrial Development

The expressed community desire to have the site generate jobs was examined particularly because of the potential for development under its industrial zoning. The consultant team recognized that commercial and industrial development would not be appropriate for the hospital campus portion of the site because the buildings would not be readily adaptable for such uses, and new construction of industrial and commercial buildings would diminish the area's historic and open space qualities.

The remainder of the site was, however, considered more appropriate. The western industrial area was seen as ideal for industry and offices, although required parking was identified as a potential problem if the lab building were to be converted to offices. The southeastern corner of the site, with its frontage on the BQE, was considered as well-suited to retail development, specifically gas stations, fast food, and strip retail that would take advantage of the access and visibility from the expressway; parking was envisaged on the ballfield (cemetery). The northern triangle was also considered a suitable location for industry and warehousing, with the anticipation that existing structures would be removed and replaced by a new warehouse, with new access to Kent Avenue provided via city-owned land.

Large-scale retail of more than 10,000 sq ft (929 sq m) is not permitted under M3-1 (heavy industry) zoning and, even if the site were to be rezoned to M1 (light industry), large-scale retail would still require a special permit from the NYC City Planning Commission (CPC). The consultant team considered no portion of the site as ideal for large retail because of access and parking requirements. Nevertheless, a large retail facility such as a supermarket or home center was considered viable,

specifically for the BQE frontage if enlarged to five or more acres. Other sites associated with the Navy Yard industrial park were considered preferable by developers of these types of retail.

2.2.3 Reuse Plan

The following is a summary of the Reuse Plan proposed by the City of New York, Mayor's Office for Economic Development Planning and Administration, as presented in *Redevelopment Plan for Naval Station Brooklyn, New York*, March 1996.

The Reuse Plan capitalizes on the site's assets in terms of its industrial facilities and proximity to the rest of the Brooklyn Navy Yard and seeks to minimize any impacts on the historic campus of the hospital. No new construction is proposed; rather, the plan calls for the continued use for industrial or commercial activity of buildings used by the Navy for such purposes, and the adaptive reuse of residential and hospital facilities for community institutional purposes. The proposed plan is shown in Figure 2-2 (The Reuse Plan).

To implement the Reuse Plan, the City of New York would transfer control and management of the three industrial/commercial parcels to the BNYDC and the publicly accessible open space would be placed under the control of the NYC Department of Parks and Recreation. No specific proposal is made with respect to the implementation of the institutional component because no users are designated at this time. The city may opt to negotiate leases directly with prospective users, or may utilize the BNYDC to provide overall management with subleases to institutional users. The major elements of the Reuse Plan are described in the following subchapters.

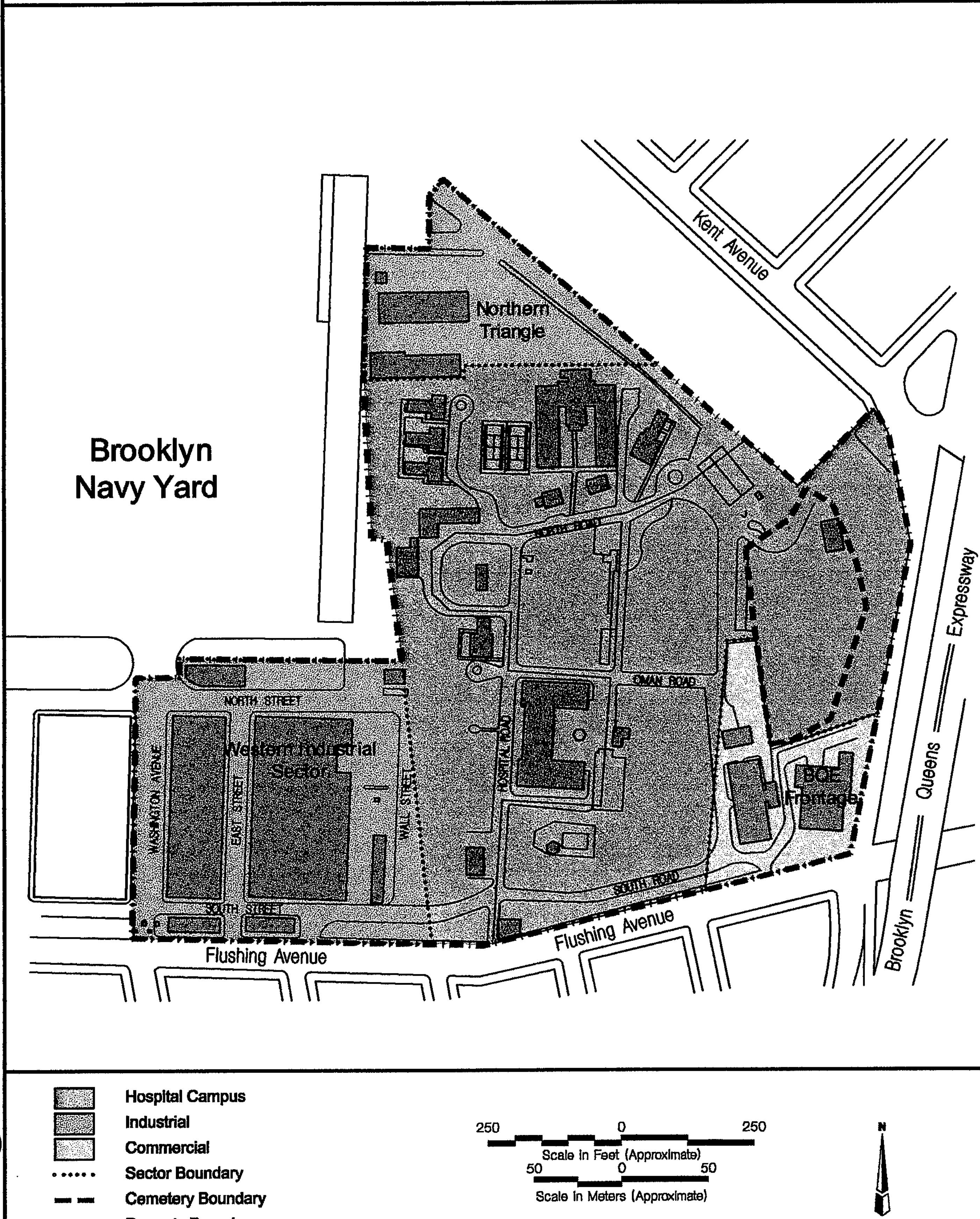
Economic Development

Of the three areas proposed for activities to generate jobs and tax revenue, two are oriented for industrial jobs:

- Northern triangle: Consisting of 2.2 acres (0.9 hectares) at the far northern end of the site, this area includes two small buildings (Bldg 305 is a two-story office building of approximately 19,700 sq ft [1,830 sq m], and Bldgs 306 and 316 are the front and rear of a single warehouse totaling about 12,300 sq ft [1,143 sq m]) that are appropriate for light industry or warehousing. Additional space on the parcel could be for parking; and

- Western industrial sector: This area of 6.4 acres (2.6 hectares) at the southwestern edge of the site includes two major buildings. Building 1 is the seven-story lab building, with about 245,100 sq ft (22,770 sq m) suitable for a variety of high-tech manufacturing, research, or a mix of light industry and offices. Building 2 is the

The Reuse Plan



Source: NYC Redevelopment Plan, 1996.

Figure 2-2

foundry building, with about 118,500 sq ft (11,000 sq m) suitable for vehicle repair. This area also includes two smaller two-story office buildings (Bldg 3, about 5,700 sq ft [525 sq m], and Bldg 5, about 6,700 sq ft [650 sq m]).

Both of these areas are at grade with the surrounding streets and the rest of the Navy Yard and would be integrated with the property of the BNYDC, the organization that manages the Brooklyn Navy Yard industrial park for the city's Economic Development Corporation (EDC).

The third parcel is proposed for new commercial uses:

- BQE frontage: At the site's southeast corner, fronting on Flushing Avenue and Williamsburg Street and facing the elevated BQE, this parcel of about two acres (0.8 hectares) includes Bldg 311 (Motion Picture Office Building, about 21,600 sq ft [2,000 sq m]), Bldg RD (Bachelor Enlisted Quarters, about 28,500 sq ft [2,650 sq m]) and Bldg R426 (the morgue, about 2,400 sq ft [220 sq m]). Because of its highly accessible location, this portion of the site could be easily utilized for small-scale convenience retail. Other light industrial users have expressed interest in the parcel; however, any such uses would also be managed through the BNYDC.

Park, Historic Preservation, and Institutional Uses

The remaining part of the site, known as the hospital campus (about 18.3 acres [7.4 hectares]), would be used for open space, recreational, and/or institutional/not-for-profit purposes. In preparing the Reuse Plan, the city recognized the scarcity of adequate open space in the site's surrounding communities, and has proposed to make most of the campus grounds publicly accessible. The plan proposes a combination of passive and active recreational space. While no specific use of the buildings is yet identified, possible uses include a day-care center, a health center, a job-training center, a school, or institutional offices. Approximately 200 visitors per day are estimated for these institutional components, in addition to the projected employment. The open-space elements would be designed to complement these possible uses. However, none of these community facility uses are permitted under the existing M3 (heavy industry) zoning; thus, the city has proposed a rezoning to C8, a commercial district (automobile and other heavy commercial services) that allows non-residential community facilities.

At the time the city developed its Reuse Plan, it was unaware of possible human remains being still located in the area of the Naval Hospital Cemetery; consequently, the city envisaged this area continuing in use as an active ballfield. Pursuant to comments at the public scoping meeting, the Navy undertook extensive documentary research of the cemetery operations (from 1831 to 1926) and of its closure and the transfer of remains to Cypress Hills National Cemetery, Brooklyn, in 1926. This research has determined that over 500 burials were not documented as removed from the cemetery in 1926 (US Navy, 1999).

The Navy has subsequently developed a cemetery plan that will remove modern intrusions from the area (ballfield equipment and irrigation piping) and provide a grassy cover for the cemetery, landscaping for the areas immediately outside the cemetery, and errection of a Naval Cemetery sign (Figure 2-3, Naval Cemetery Plan).

Table 2-3 summarizes the land use aspects of the city's Reuse Plan. The plan does not specify or develop data on the anticipated costs of renovation, demolition, or infrastructure development. Some demolition of minor structures (e.g., police booth, greenhouse, gazebo, steam reducing station) would be expected. The industrial structures would require only a modest amount of renovation expenditure in order to be leasable. However, the commercial and institutional structures are likely to need extensive renovation. An expenditure of $50 per sq ft is assumed here for renovation costs associated with the commercial and institutional space but is not intended to provide an accurate cost estimate, only a rough order of magnitude of minimum expenses involved in the reuse of these structures.

Additional expenses would be involved with upgrading the infrastructure. In 1992, the city's consultant team anticipated infrastructure and site development costs of at least $7.2 million, plus the necessary engineering studies. In particular, the street system serving the former residential buildings on the campus may require upgrading to meet code levels for emergency vehicle access. The city's plan identified potential new access to the site at Kent Avenue (opposite Rodney Street and opposite Hewes Street) and on Flushing Avenue (at the southeast corner of the site near Williamsburg Street). Former site gateways on Flushing Avenue at the old Hospital Gatehouse and at the NAVSTA Brooklyn entrance (opposite Washington Avenue) are also included in the plan as possible site access points.

2.3 Alternatives to be Considered Under NEPA

The city's proposed Reuse Plan is the preferred alternative for this EIS. However, pursuant to NEPA and the regulations of the CEQ, an EIS must consider other reasonable alternatives as well as the No Action Alternative. The Residential Alternative emerged as a proposal during the city's planning process and although it was rejected then it remains a reasonable alternative in terms of market viability and community interest, if the site were to be rezoned to permit this use. The Residential Alternative would be a less intensive reuse of the site than the Preferred Reuse Plan. The Museum Alternative emerged as a concept during the Navy's public scoping meetings for this EIS and is based on aspects of several community proposals presented to the Navy at that time. This alternative, like the Residential Alternative, provided for less employment at the site but would generate a substantial visitor population.

Naval Cemetery Plan

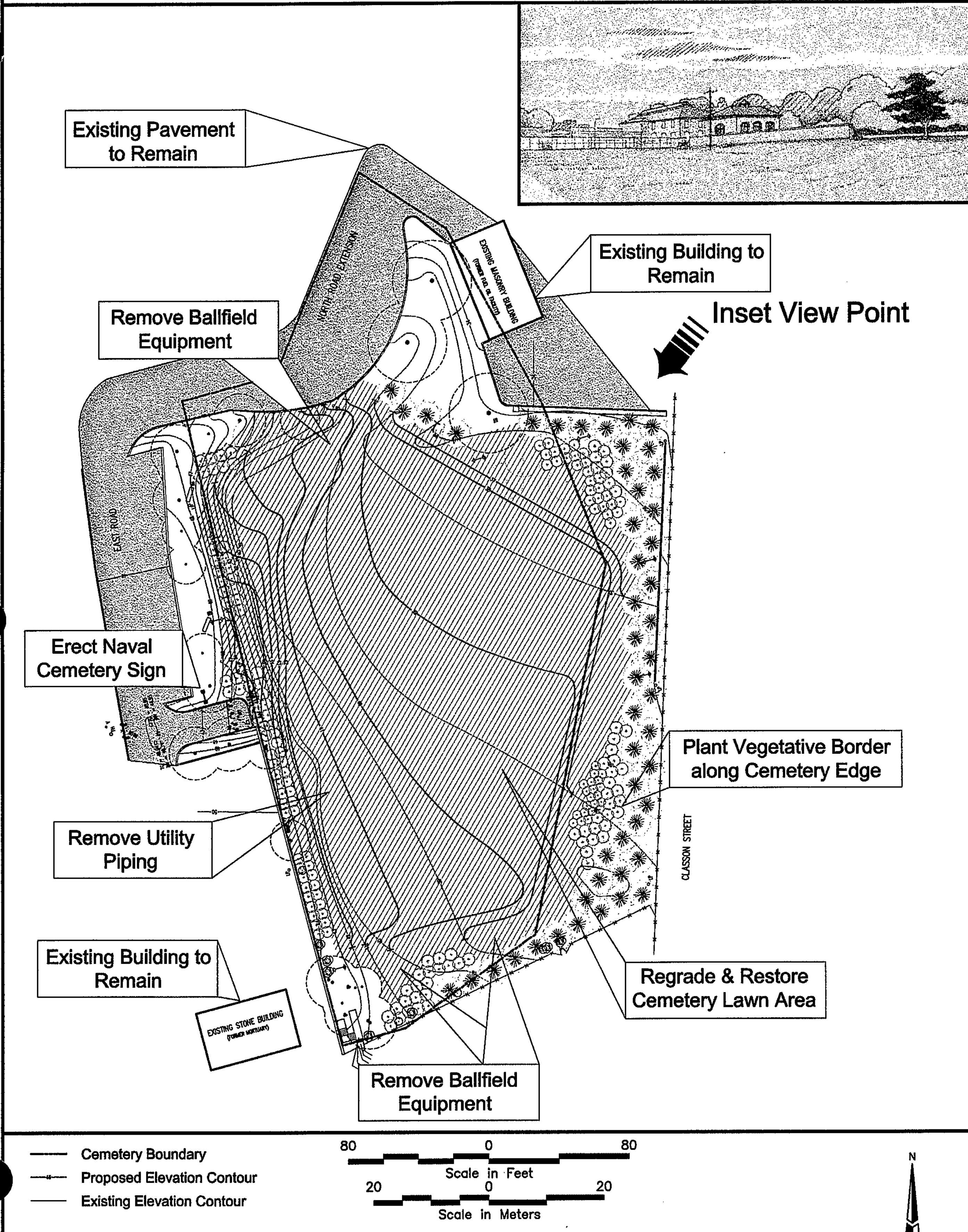


Figure 2-3

Table 2-3

Reuse Plan Land Use Program

Sector/ Use	Area		Estimated Development in Existing Structures (000s sq ft [sq m])				Publicly Accessible Open Space Acres (Hectares)			Est. Parking Spaces
	Acres (Hectares)	% of Total	Industrial	Commercial	Institutional	Total	Active	Passive	Cemetery	
Northern Triangle/ Industrial	2.2 (0.9)	7.6	32.0 (3.0)	0	0	32.0 (3.0)	0	0	N/A	200
Western Industrial Sector	6.4 (2.6)	22.1	427.8 (40.4)	0	0	427.8 (40.4)	0	0	N/A	400
BQE Frontage	2.0 (0.8)	6.8	0	52.5 (4.9)	0	52.5 (4.9)	0	0	N/A	150
Hospital Campus	18.3 (7.4)	63.4	0	0	145.0 (13.5)	145.0 (13.5)	2.4 (0.97)	7.7 (3.1)	1.7 (0.7)	50*
Total**	28.8 (11.7)	100	459.8 (43.4)	52.5 (4.9)	145.0 (13.5)	657.2 (61.1)	2.4 (0.97)	7.7 (3.1)	1.7 (0.7)	800

Notes: * parking assigned to existing paved area, more could be provided at expense of unpaved areas.
** numbers may not add exactly due to rounding.

Source: *Redevelopment Plan for Naval Station Brooklyn, New York*, City of New York, 1996.

In addition, the City Environmental Quality Review (CEQR) process requires a consideration of as-of-right development as a baseline against which to measure other alternatives. As-of-right, in this context, refers to the existing M3 (heavy industry) zoning and would assume a full buildout of the site to the maximum permitted under this zoning; this would provide for a very intensive use of the site. Thus, in addition to the No Action Alternative, three alternative plans are presented herein.

2.3.1 No Action Alternative

This EIS includes the No Action Alternative, which is defined as follows: NAVSTA Brooklyn would remain closed, and the land is retained as federal government land subject to *Base Realignment and Closure Facility Layaway and Caretaker Standards* (US Navy, 1994). Continued government ownership of the property would be of no benefit to the Navy as the Navy would thereby incur continued liability for an asset that has no functional, operational, or strategic value. Continued federal government ownership would also be of no benefit to the local community since such ownership would prevent viable and productive use of the land.

2.3.2 Residential Alternative

Under the Residential Alternative, buildings comprising the campus portion of the site would be converted to residential use. Those portions of the NAVSTA Brooklyn site designated for industrial and commercial use in the city's Reuse Plan would continue to be designated for these same uses under the Residential Alternative. No new residential construction is proposed, only the adaptive reuse of the hospital and upgrading of buildings that were formerly residential. The latter buildings range from the Surgeon's House (Bldg R1) to the Bachelor Officers' Quarters (Bldg RG).

The buildings to be reused as residences would be divided into 94 housing units, with a total of 137,240 sq ft (12,760 sq m), but fewer or greater numbers could be generated depending on the unit type and size. The land use program under the Residential Alternative for NAVSTA Brooklyn is shown in Table 2-4.

As noted earlier, no analysis of the most efficient and marketable layouts or specific costs of renovation have been prepared by the city or are developed here. Clearly, some buildings will require much more expensive upgrading (the hospital) than others (cottages, duplexes, etc.).

There is no formal sponsor for a residential alternative at this time, but the strong housing demand in Brooklyn, together with the unique ambience and substantial amenities of the site, could allow for a feasible market development of the site. The mix of building and unit types could make for interest

Table 2-4

Residential Alternative Land Use Program

Sector/ Use	Area		Estimated Development in Existing Structures (000s sq ft [sq m])				Publicly Accessible Open Space (Acres [Hectares])			Est. Parking Spaces
	Acres (Hectares)	% of Total	Industrial	Commercial	Residential	Total	Active	Passive	Cemetery	
Northern Triangle/ Industrial	2.2 (0.9)	7.6	32.0 (3.0)	0	0	32.0 (3.0)	0	0	N/A	200
Western Industrial Sector	6.4 (2.6)	22.1	427.8 (40.4)	0	0	427.8 (40.4)	0	0	N/A	400
BQE Frontage	2.0 (0.8)	6.8	0	52.5 (4.9)	0	52.5 (4.9)	0	0	N/A	150
Hospital Campus	18.3 (7.4)	63.4	0	0	137.0 (16.0)	137.0 (16.0)	0	0	1.7 (0.7)	60**
Total*	28.8 (11.7)	100	459.8 (43.4)	52.5 (4.9)	137.0 (12.8)	649.3 (60.3)	0	0	1.7 (0.7)	810

Notes: * Numbers may not add exactly due to rounding.
**Parking assigned to existing paved area, more could be provided at expense of unpaved areas.

in the reuse of the campus portion of the site by some institutional sponsor, perhaps for a senior and/or assisted-living complex. There are also constraints to residential development at the site, including its relative isolation by existing industrial uses, the need to cross beneath the BQE (I-278), and the distance from the nearest subway (approximately 0.75 miles [1.2 km]).

Residential uses at the NAVSTA Brooklyn site would require a rezoning by the city from the existing M3 district to a district permitting residential use. An R6 district (a general residence district widely mapped in Brooklyn and the surrounding residential parts of the study area) is proposed here as adequate to bring into conformity the residential conversions proposed under this alternative. R6 permits multi-family apartment structures with a floor area ratio (FAR) of 2.0 (the FAR is the amount of usable space that is permitted as a ratio to the area of the parcel). Parking would be required for 70 percent of the dwelling units (55 percent if for a publicly assisted housing project).

2.3.3 Museum Alternative

Under the Museum Alternative, buildings comprising the campus portion of the site would be converted to educational/exhibition uses (Use Group 3 in the NYC Zoning Resolution). Those portions of the NAVSTA Brooklyn site designated for industrial use in the city's Reuse Plan (northern triangle and western sector) would continue to be designated for those uses under this alternative; however, the BQE frontage, at Kent and Flushing Avenues, would also be included as part of the museum complex. No new construction is proposed, only the adaptive reuse of the hospital and other buildings that comprise the campus and BQE frontage portions of the site. In total, these buildings amount to approximately 233,000 sq ft (21,650 sq m) located on about 20 acres (eight hectares).

There is no formal sponsor for the Museum Alternative at this time; however, two organizations have presented proposals of this nature. One is from the 369th Historical Society, an organization focused on the role of African-Americans in the US military (MG N. James, September 2, 1997). Their proposal includes: a memorial area where the cemetery is located; an African-American military museum in the hospital; a veterans' aide center in Bldg RD (Bachelor Enlisted Quarters); a children's center in Bldg R246 (morgue); a military academy for high school students in Bldgs RG and R4 (Bachelor Officers' Quarters and three-story house); a bed-and-breakfast in Bldgs R1, R2, and R3 (Surgeon's House, West House, and East House); and a fast-food franchise in Bldg R475 (service station).

The other proposal is from the Wallabout Partners Associated, which has published an undated document entitled: *Planning a Future for the Past: Creating the Children's National Science Harbor Exploratorium at a New Wallabout Bay Naval Reserve Academy & Early Science Training Center, located at the Proposed New Brooklyn Navy Yard National Historic Industrial Park.* This document, together with another dated March 28, 1996, and variously titled: *A Report to Brooklyn Community*

Board #2 and Elected Officials; The Preferred Alternate Base Closure-Reuse Plan & Program; The Planning Concept "Planning a Future for the Past;" and *The Program Concept "Creating the New World Maritime Center,"* suggest a reuse scheme that would include much of the BNYDC Navy Yard, envisaging an "exploratorium" of the ship repair functions that continue there, a new waterfront park, and other elements that are beyond the boundaries of NAVSTA Brooklyn. Their proposal also would include *all* areas of the NAVSTA Brooklyn site, for example, including the lab in the western sector.

The scenario examined here as the Museum Alternative is not specifically defined but could accommodate elements common to both these "museum" proposals. Table 2-5 shows the land use program for the Museum Alternative analyzed here, which is limited to the approximately 20-acre (eight-hectare) hospital campus and BQE frontage subareas. This would provide a substantial base from which to begin an educational and exhibition endeavor with the potential for expanding such activities to other parts of the Navy Yard as city policy provides.

Neither of the two museum proposals provide details on estimated costs of development or the number of jobs, students, or visitors. The numbers adopted for this review represent only reasonable estimates based on other maritime-oriented museums, such as:

- The very popular seaport museum at Mystic, CT, which draws 360,000 visitors a year;

- Fort Griswold, across the Thames River from New London, CT (and in close proximity to the seaport museum at Mystic), which is a park and museum attracting about 30,000 visitors a year;

- A proposed reuse of Naval Undersea Warfare Center (NUWC) New London, CT as a park and museum. As such, reuse analysts anticipate that the historic part of the base that included Fort Trumbull might draw 10,000-25,000 visitors a year as a relatively passive museum attraction, but with much additional investment (i.e., festivals, military reenactments, etc.) to create a "destination attraction" the site could attract 70,000-100,000 visitors a year (Economic Research Associates [ERA], 1996, p.105-107);

- The Brooklyn Children's Museum, a city-funded facility about two miles (3.2 km) to the southeast of NAVSTA Brooklyn, which is reported to attract 200,000 visitors a year (Sumpter, June 3, 1998); and

- Sailors Snug Harbor, a cultural facility on the north shore of Staten Island, NY, which is reported to attract 250,000 annual visitors (Corallo, June 3, 1998).

Table 2-5

Museum Alternative Land Use Program

Sector/ Use	Area		Estimated Development in Existing Structures (000s sq ft [sq m])				Publicly Accessible Open Space (hectares [acres])			Est. Parking Spaces
	Acres (Hectares)	% of Total	Industrial	Commercial	Museum	Total	Active	Passive	Cemetery	
Northern Triangle/ Industrial	2.2 (0.9)	7.6	32.0 (3.0)	0	0	32.0 (3.0)	0	0	N/A	200
Western Industrial Sector	6.4 (2.6)	22.1	427.8 (40.4)	0	0	427.8 (40.4)	0	0	N/A	400
BQE Frontage	2.0 (0.8)	6.8	0	0	52.5 (4.9)	52.5 (4.9)	0	0	N/A	150
Hospital Campus	18.3 (7.4)	63.4	0	0	145.0 (13.5)	145.0 (13.5)	0	9.4 (3.8)	1.7 (0.7)	50**
Total*	28.8 (11.7)	100	459.8 (43.4)	0	197.5 (18.4)	657.3 (61.8)	0	9.4 (3.8)	1.7 (0.7)	800

Notes: * Numbers may not add exactly due to rounding.
** Parking assigned to existing paved area; more could be provided at expense of unpaved areas.

Clearly, the number of prospective visitors to the museum could vary substantially; however, for purposes of this EIS a reasonable estimate of 200,000 per year (about 550 per day) is adopted for assessing traffic and other effects.

In order to conform to the NYC Zoning Resolution, a museum use on the site would require a rezoning action. For the Museum Alterative it is proposed that, on the areas of the site to be devoted to the museum, the existing M3 (heavy industry) district be changed to a C2-6, a zoning district for general commercial uses permitting this type of community facility, with a commercial floor area ratio (FAR) of 2.0 and with no parking requirement.

2.3.4 As-of-Right Alternative

The As-of-Right Alternative is provided for comparative purposes under CEQR. With this alternative, the full buildout of the site as permitted by NYC zoning is assumed. The fact that the site includes two NYC-landmarked buildings (the Naval Hospital and the Surgeon's House) and has been determined eligible for the National Register of Historic Places as a historic district by the New York State Historic Preservation Office (SHPO) presents potential complications for this scenario. In particular, landmarked structures can only be demolished for "hardship" reasons and such action would require extensive documentation and review.

As such, it is assumed that the As-of-Right Alternative would retain four principal buildings: the hospital, Surgeon's House, the lab, and the foundry. All other structures would be demolished and new industrial/warehouse structures would be constructed to the maximum bulk permitted. The cemetery area would remain unbuilt as open space.

The site encompasses approximately 28.8 acres, or 1,256,000 sq ft (11.7 hectares, or 116,682 sq m). The retained buildings would account for about 423,000 sq ft (39,300 sq m) of floor area. The permitted 2.0 FAR under the existing M3-1 zoning permits a maximum floor area of about 2,512,000 sq ft (233,500 sq m). Deducting the floor area of the retained buildings would provide maximum new construction of about 2,089,000 sq ft (194,000 sq m).

Parking requirements vary according to type of use, ranging from one space per 300 sq ft (28 sq m) for general retail to one space per 2,000 sq ft (186 sq m), or per three employees (whichever is lower), for warehouse/storage uses. It is assumed here that the uses would be mostly of the warehouse/storage type with the requirement of one space per 2,000 sq ft (i.e., about 1,250 spaces). However, a wide range of alternate uses are permitted under M3-1 zoning, ranging from garbage transfer stations to general manufacturing, to certain "big box" retail (such as a Home Depot or Costco). Consequently, the buildout assessed here is merely one possible scenario of as-of-right development.

The required parking, assuming 300 sq ft (28 sq m) per space, would consume approximately 376,000 sq ft (35,000 sq m). Further deducting the footprints of the retained buildings (about 118,000 sq ft (11,000 sq m]) and the cemetery area (about 72,300 sq ft [6,700 sq m]) leaves approximately 690,000 sq ft (64,100 sq m) to accommodate the new construction and additional roadways. Allowing ten percent of the area for roadways (69,000 sq ft [6,400 sq m]), leaves approximately 621,000 sq ft (57,700 sq m) to accommodate the permitted increment of 2,089,000 sq ft (194,000 sq m), which would, therefore, have to be accommodated in three- to four-story structures if the maximum floor area were to be realized. It is acknowledged that the demand for new three-story industrial/warehouse space is very limited in the city and that the scenario represents only a legal potential rather than a market likelihood. The land use program to be analyzed under the As-of-Right Alternative is shown in Table 2-6.

Table 2-6

As-of-Right Alternative Land Use Program

Sector/ Use	Area		Estimated Industrial/Warehouse Development (000s sq ft [sq m])			Publicly Accessible Open Space (Acres [Hectares])			Est. Parking Spaces
	Acres (Hectares)	% of Total	In Existing Structures	In New Structures	Total	Active	Passive	Cemetery	
Northern Triangle/ Industrial	2.2 (0.9)	7.6	0	192.0 (17.8)	192.0 (17.8)	0	0	N/A	*
Western Industrial Sector	6.4 (2.6)	22.1	364.0 (33.8)	192.0 (17.8)	556.0 (51.6)	0	0	N/A	*
BQE Frontage	2.0 (0.8)	6.8	0	172.0 (15.9)	172.0 (15.9)	0	0	N/A	*
Hospital Campus	18.3 (7.4)	63.4	59.0 (5.5)	1,534.0 (139.1)	1,593.0 (147.9)	0	0	1.7 (0.7)	*
Total**	28.8 (11.7)	100	423 (39.3)	2,090 (194.2)	2,512 (233.3)	0	0	1.7 (0.7)	1,250

Notes: * Parking assigned to entire site rather than to specific sub-areas.
** Numbers may not add exactly due to rounding.

3 AFFECTED ENVIRONMENT

This chapter describes the affected environment of the area in the vicinity of NAVSTA Brooklyn that may be directly or indirectly affected by the proposed action. For the area within the site boundaries, the infrastructure, cultural resources, natural resources, and hazardous waste components of this EIS are described. The study area selected for the land use, socioeconomics, community services, traffic, air quality, and noise components comprises approximately a 0.5-mi (0.8- km) radius of NAVSTA Brooklyn (Figure 3.1-1, Study Area Boundaries with Census Tracts).

3.1 Land Use, Zoning, Public Policy, & Neighborhood Character

3.1.1 Land Use

On-Site Land Use

The site of NAVSTA Brooklyn that remains under Navy control consists of 28.8 acres (11.7 hectares) (Figure 2-1) and, while including elements of the former Brooklyn Naval Shipyard (Navy Yard), it is mostly comprised of what was known as the Hospital Annex. In fact, the land use pattern of the site reflects its long history as a Naval hospital adjacent to the Navy Yard. The Hospital Annex was purchased in 1824 and the landmark hospital, built over 1830-38, continued in operation until 1948 when its functions were transferred to the Naval Hospital at St. Albans, in Queens, NY.

The Hospital Annex underwent a major building program during WW I and WW II, so that most of the site was covered by medical and support structures. However, in 1966 the Navy ended the ship repair operations and disposed of the main part of the Navy Yard. The former Navy Yard now functions as an industrial park operated by the BNYDC, a subsidiary of the city's EDC.

Through the 1980s the Navy consolidated NAVSTA Brooklyn's activities onto the part of the base that had functioned as the hospital campus, also utilizing several adjacent structures that had been associated more with shipyard functions (in particular, the lab and the foundry). During this time NAVSTA Brooklyn functioned as the administrative headquarters of NAVSTA New York, providing personnel housing and administrative support (Ecology and Environment, Inc, 1990).

Many of the structures in the Hospital Annex were demolished, particularly during 1975-85 as the Navy wound down its operations and ultimately closed the facility, transferring the operations of NAVSTA Brooklyn to NAVSTA Staten Island in 1988. Today, most of the NAVSTA Brooklyn site remains inactive, except for federal protective services and the Navy's leasing of the foundry building to the BNYDC and one of its tenants that constructs modular homes there.

The site that remains Navy-owned may be broadly categorized into four distinct areas and land uses:

- The institutional campus (18.3 acres [7.4 hectares]), with the hospital located on a hill 15 ft (4.6 m) above the rest of the site. The campus also includes the Surgeon's House, various other housing structures, gatehouse, playing fields, and the cemetery. The only occupied buildings are the duplex houses used for security purposes;

- The northern industrial triangle (2.2 acres [0.9 hectares]), with two vacant warehouse/office structures located on a lower grade than the campus and more readily associated with the remainder of the BNYDC industrial park;

- The BQE frontage area (two acres [0.8 hectares]), which is in the southeast corner of the site and includes the vacant motion picture office building and the morgue; and

- The western industrial sector of the site (6.4 acres [2.6 hectares]), a flat rectangular industrial area that contains the lab (seven stories) and the foundry (about 50 ft [15 m] in height), which are the site's two largest buildings, and several small ancillary buildings. This area is adjacent and similar in scale to much of the remainder of the BNYDC industrial park.

Figure 2-1 and Tables 2-1 and 2-2 identify the buildings and these areas of the site.

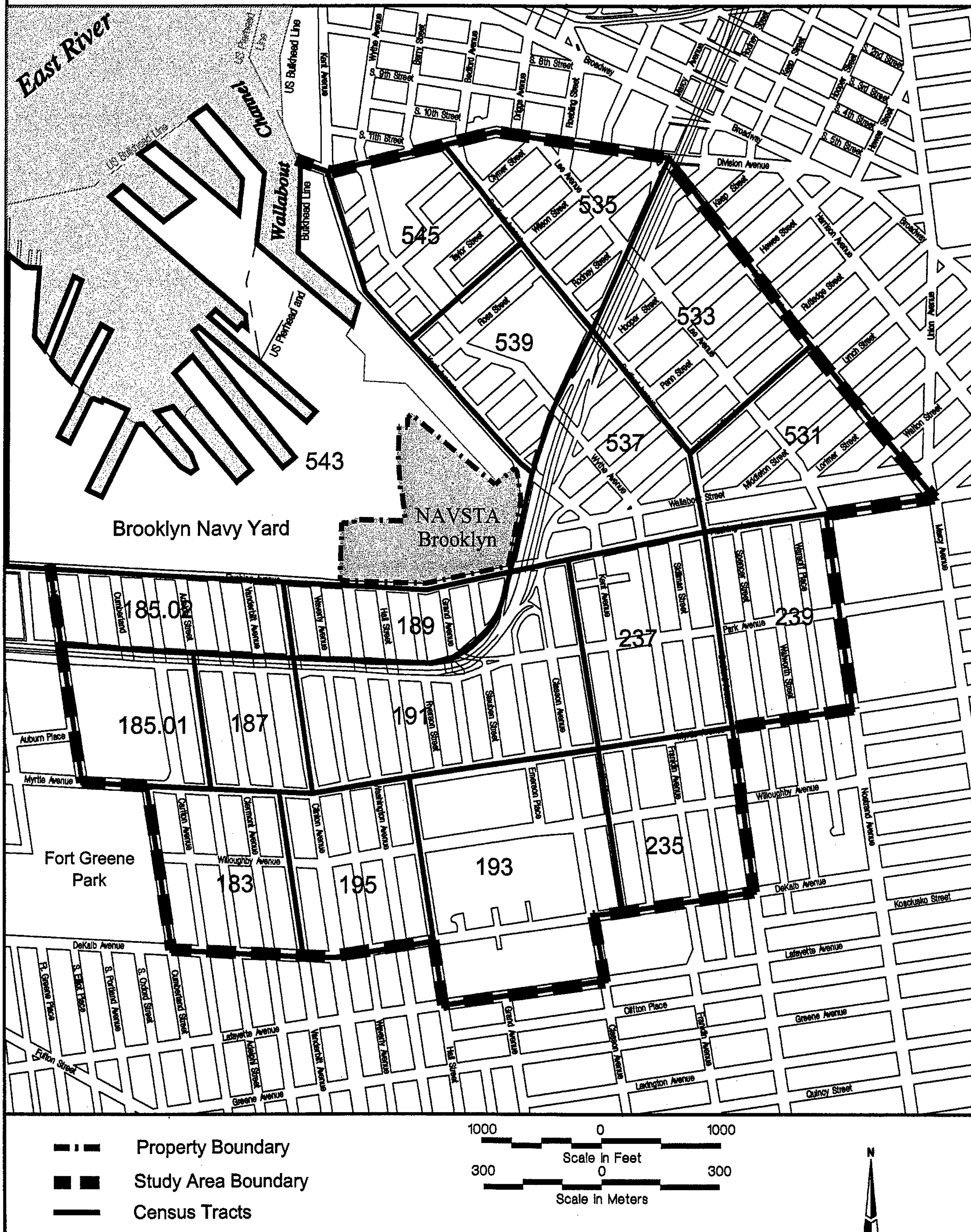
Off-Site Land Use

Existing land use patterns for the area immediately surrounding NAVSTA Brooklyn are shown in Figure 3.1-2, Land Use Surrounding NAVSTA Brooklyn, which is derived from the 1990 land use map published by the NYC Department of City Planning (DCP) and field surveys in spring 1998.

The land use pattern in this section of Brooklyn is a mix of uses, being predominantly industrial in the lower-lying areas and residential and institutional in the topographically higher areas. There is very little public open space. The 19th-century growth of the area was substantially the result of industrial and warehouse activity associated with the Navy Yard and the Brooklyn waterfront. The Navy Yard itself, currently operated as an industrial park by BNYDC, is still associated with a number of ship repair and various manufacturing activities. A movie studio is proposed for construction near the NAVSTA Brooklyn western border. A helicopter service facility (no passengers) is proposed on Pier "G," about 2,000 ft (600 m) from NAVSTA Brooklyn's northern tip.

Industrial and warehousing activities also dominate the first of the upland blocks from the Navy Yard (between Flushing and Park Avenues). Industrial uses are interspersed with residences on the next upland block between Park and Myrtle Avenues, particularly in the eastern portion of the study area. Park Avenue carries the BQE, on structure, through this industrial area until it swings northeast to

Study Area Boundaries with Census Tracts



Source: New York City Land Use Map, 1990

Figure 3.1 - 1

Land Use Surrounding NAVSTA Brooklyn

Figure 3.1-2

pass adjacent to the NAVSTA Brooklyn site between Kent and Flushing Avenues. The industrial sector continues eastwards on the low-lying land that, in the 19th century, was served by the Wallabout Canal.

In the southwest of the study area, residential uses begin with the Walt Whitman Houses, a NYC Housing Authority project with 3,500 units in 13- and 6-story towers in the "superblock" between Park and Myrtle Avenues and Portland and Carlton Avenues. South of this complex, and immediately beyond the study area, is Fort Greene Park, a major 30-acre (12-hectare) facility with a landmark tower dedicated to the American prisoners of war who died on board British prison ships moored at Wallabout Bay (in what is now the Navy Yard). East of the park, between Myrtle and DeKalb Avenues, are a series of residential blocks, generally known as Clinton Hill, that are characterized by handsome brownstone rowhouses. This section includes the Catholic Bishop's residence, St. Joseph's College, and Pratt Institute.

To the northeast of the site, the other principal residential section of the study area, is the Satmar Hasidic Jewish community of Williamsburg. Much of this area to the west of the BQE was recently developed under an urban renewal plan so that its general appearance is of modern buildings ranging in character from 24-story towers to three-story rowhouses. To the east of the BQE, this residential section is composed mostly of older walk-up tenements. Interspersed throughout the community are numerous parochial schools and temples.

Additional institutional uses in the study area are identified and presented in more detail in Subchapter 3.3. These include a number of public schools, churches, small parks, and playgrounds. No hospitals are located in the study area.

Two distinct commercial strips provide local retail services. In the Clinton Hill community, stores are mostly located on the ground floors of walk-up residential tenements on Myrtle Avenue between Carlton and Bedford Avenues. Lee Avenue similarly serves the Williamsburg section of the study area. The Williamsburg area also has a more modern supermarket at Division and Wythe Avenues.

Modest amounts of vacant and underutilized land exist in the study area, particularly in the manufacturing districts. Scattered vacant lots occur in the blocks between Flushing and Park Avenues, near the Navy Yard, and particularly in the eastern manufacturing district that extends between Myrtle Avenue and Wallabout Street. This section of the industrial area is presently undergoing some transformation to residential and community facility uses, especially around Wallabout Street, where Hasidic religious organizations are sponsoring several new residential developments (e.g., a five-story structure under construction between Wallabout Street and Flushing Avenue at Bedford Avenue). In this way, the Hasidic residential section is expanding south into the industrial area, facilitated by recent zoning map changes and variances from the zoning regulations of the manufacturing district.

3.1.2 Zoning

The NYC Zoning Resolution is the city's official land use code; the relevant maps for the study area are compiled in Figure 3.1-3, Zoning Districts. The NAVSTA Brooklyn site is part of the M3-1 district that covers the entire Navy Yard. M3-1 districts permit a wide range of heavy industry with the city's least stringent performance standards. M3-1 differs from M3-2 districts only in that parking is required in M3-1. Floor area ratios (FAR) are 2.0 in M3 districts.

An M1-2 district covers most of the first upland block from the Navy Yard (Flushing to Park Avenues) and extends more broadly as the district continues east of NAVSTA Brooklyn and also includes an M1-1 district between Park and Myrtle Avenues. M1 districts are designated for light industry with high performance standards required. A wide variety of industrial and warehouse activities are permitted as long as they conform to the performance standards. No residential development is permitted but most community facilities are allowed. Parking requirements vary but are required in both M1-1 and M1-2 districts. FAR in M1-1 is 1.0 and 2.0 in M1-2.

The higher ground to the south and northeast of these manufacturing districts is designated for medium-density residential uses, either R6 or R7-1. These districts permit development typically between six and 12 stories. R6 provides for an FAR of between 2.0 and 2.43 (the higher ratio applicable when more open space is provided) and permits up to 100 units per acre. Parking is required for 70 percent of the dwelling units. R7 provides FARs of between 2.88 and 3.44, with densities of 135 units per acre. R7-1 districts require parking for 60 percent of dwelling units.

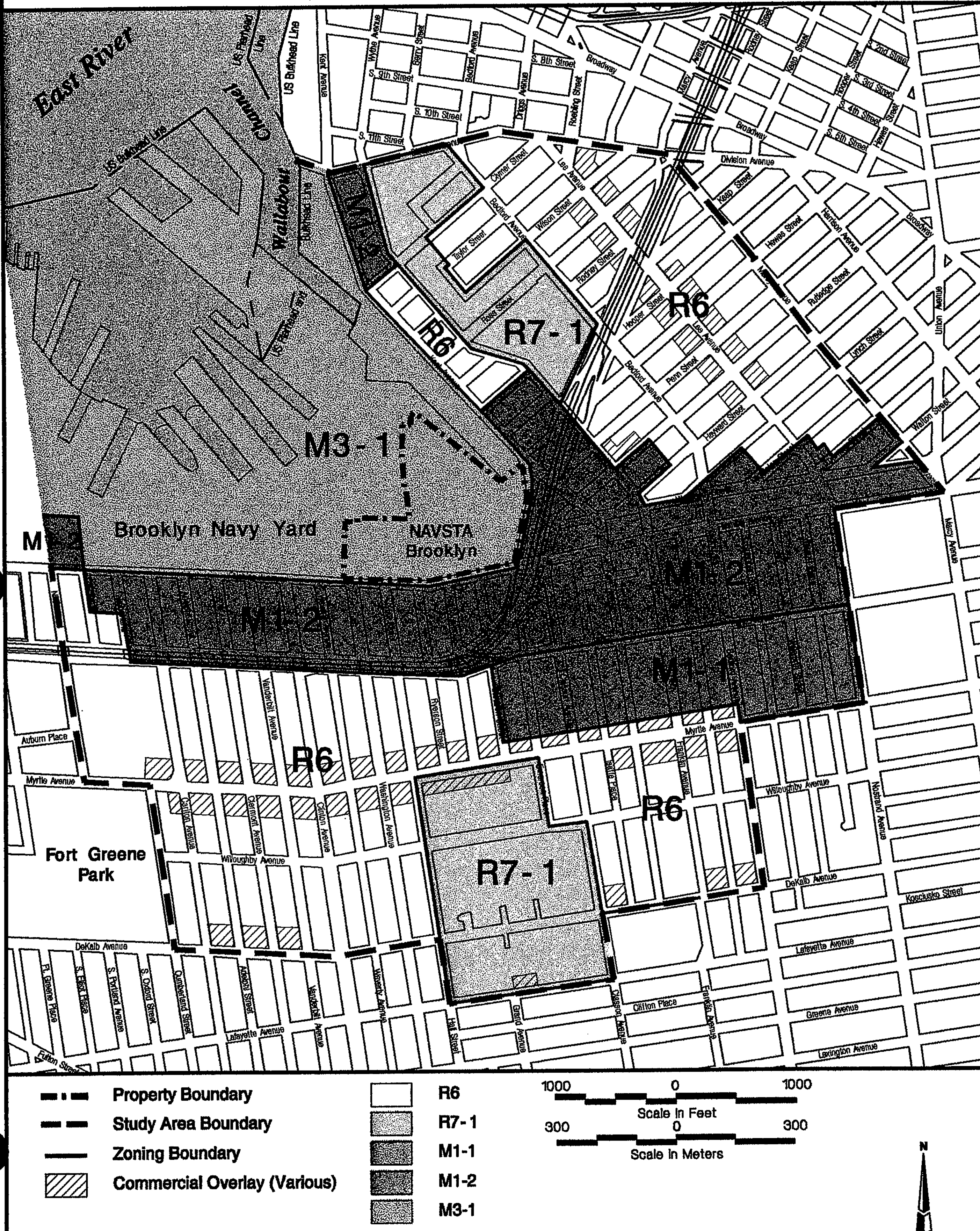
The commercial strips in the study area are zoning overlays on the residential or manufacturing districts and are either C1-3 or C1-5. Typical uses are small groceries, restaurants, dry-cleaners, and other local retail services. Maximum commercial FAR is 2.0 in the R6 and R7 districts that are located in the study area. Parking is not required in C1-5 but is required in C1-3, with various ratios depending on the use proposed. The City Planning Commission recently adopted another small commercial overlay district, C2-2, at Wythe Avenue between Penn and Rutledge Streets in the Williamsburg section of the study area. C2-2 provides local shopping and services and also permits private schools and clubs.

3.1.3 Public Policy

Waterfront Revitalization/Coastal Zone Management

The NAVSTA Brooklyn site is located within the coastal zone boundary of New York City, even though the waterfront is not visible from the site and the site boundary is about 800 ft (244 m) from the nearest water, Wallabout Channel, an embayment off of the East River (Figure 3.1-4, Coastal Zone Boundary). The Federal Coastal Zone Management Act of 1972 (PL 92-583, 16 USC 1451 et

Zoning Districts



Source: New York City Planning Commission, 1995.

Figure 3.1-3

Coastal Zone Boundary

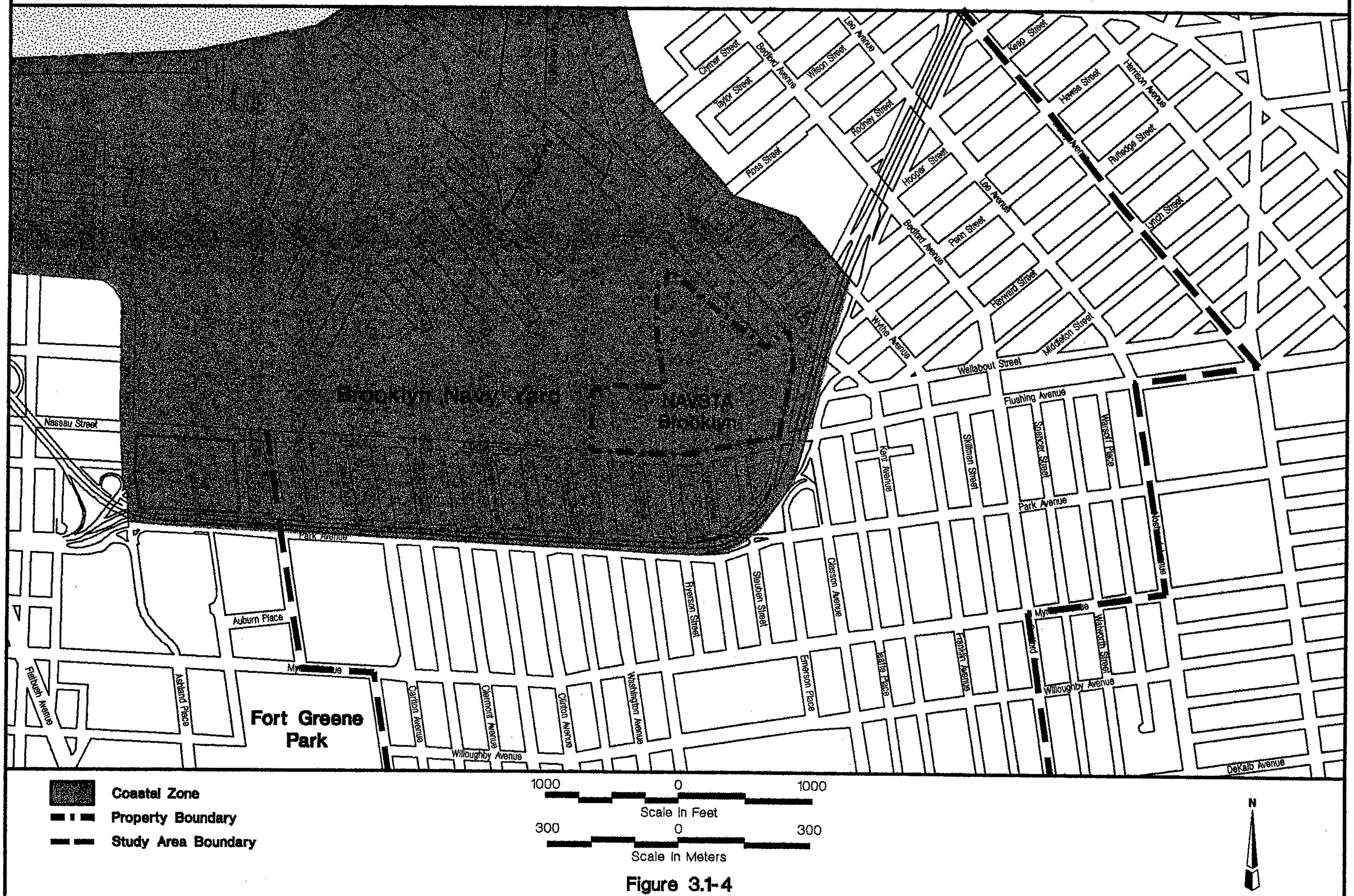


Figure 3.1-4

seq.) provides encouragement and assistance to states to "preserve, protect, develop and, whenever possible, to restore or enhance the resources of the nation's Coastal Zone." New York State's Coastal Management Program (Waterfront Revitalization and Coastal Resources Act [NYS Executive Law, 1981; Sections 910 et seq. Article 42; and implementing regulations 19 NYC Rules and Regulations [NYCRR]) enables New York City's Local Waterfront Revitalization Program (LWRP) to establish coastal zone boundaries and provide for consistency review with city, state and federal policies. The LWRP includes a set of 56 policy statements – 44 state policies and 12 city policies – that address the waterfront's important resources. The 56 policies are provided as Appendix F. Those that pertain and are applicable to the site, the Reuse Plan, and its alternatives are shown in the following textbox.

New York City Comprehensive Waterfront Plan

In the summer of 1992, the NYC Department of City Planning (DCP) released a study entitled *New York City Comprehensive Waterfront Plan, Reclaiming the Water's Edge*. The purpose of the study was to develop a comprehensive plan for use of the city's 578 miles (930 km) of shoreline. The study identified four types of waterfront environments:

- The natural waterfront (wetlands, habitats, water quality);
- The public waterfront (waterfront parks and public access);
- The working waterfront (terminals, transportation, and waterborne commerce ports); and
- The redeveloping waterfront (multi-use redevelopment projects, including maritime uses).

Plan for the Brooklyn Waterfront

In the fall of 1994, the NYC DCP released a study entitled *Plan For The Brooklyn Waterfront*, as part of NYC's Comprehensive Waterfront Plan of 1992. The purpose of the study was to detail the borough's waterfront areas. Each area is described, existing conditions are examined, waterfront planning issues are discussed, and actions to achieve goals are articulated. For the Brooklyn Navy Yard, the plan addresses:

- The public waterfront (waterfront parks and public access); and
- The working waterfront (terminals, transportation, and waterborne commerce ports).

LWRP Policy Statements Applicable to NAVSTA Brooklyn

Policy 2: Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.

Policy 4: Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity.

Policy 5: Encourage the location of development in areas where public services and facilities essential to such development are adequate.

Policy 11: Buildings and other structures will be sited on the coastal area so as to minimize damage to property and the endangering of human lives by flooding and erosion.

Policy 18: To safeguard the vital interest of the State of New York and of its citizens in the waters and other valuable resources of the state's coastal area, all practicable steps shall be taken to ensure that such interests are accorded full consideration in the deliberations, decisions and actions of state and federal bodies with authority over those waters and resources.

NYC Policy F: Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of: immobile user groups; and communities without adequate waterfront park space and/or facilities.

Policy 23: Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation.

Policy 30: Municipal, industrial and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state water quality standards.

Policy 39: The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface waters supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.

Policy 41: Land use or development in the coastal area will not cause national or state air quality standards to be violated.

Policy 43: Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.

Other Public Policy

The Williamsburg I Urban Renewal Area is located adjacent to the NAVSTA Brooklyn site, across Kent Avenue and extending north from the BQE to Division Avenue and east to Bedford Avenue. Most of the area has already been redeveloped for residential use. A new park (Roberto Clemente ballfield) at the intersection of Kent and Division Avenues (Site 5A) has recently been completed and another new park is planned at Kent Avenue and Clymer Street (Site 5C) but is not yet under construction. Between these two parks, a residential development is proposed that would utilize the shell of an existing building to construct 148 dwelling units (Site 5B) (Kapur, March 1998). Site 4, at Bedford Avenue and Ross Street, is presently under construction for a large synagogue.

3.1.4 Neighborhood Character

NAVSTA Brooklyn Site

The 28.8-acre (11.7-hectare) site of NAVSTA Brooklyn has been a federal preserve since early in the 19th century, with little or no public access. Photo 1 (end of this subchapter) shows an aerial view of the site and its context. Much of the site reflects its historical use as a hospital, set in a low-rise, campus-like context of open space and trees. The site includes two NYC-landmarked buildings (the Naval Hospital and the Surgeon's House) and has been determined to be two National Register-eligible historic districts by the NY State Historic Preservation Office (SHPO). Parts of the NAVSTA Brooklyn site (western industrial sector, northern triangle, and BQE frontage area) did not function as part of the Naval Hospital and are tied more closely in character to the industrial activities of the Navy Yard, which now operates as a city-owned industrial park under the BNYDC. The western industrial sector includes two of the site's largest structures (the lab and the foundry). Figure 2-1 and Tables 2-1 and 2-2 identify the buildings and these areas of the site.

Viewed from outside NAVSTA Brooklyn, the site is visible from:

- Perimeter streets (Flushing Avenue, Williamsburg Street, and Kent Avenue);
- From the BQE as it passes on structure/embankment along NAVSTA Brooklyn's eastern border; and
- In narrow vistas down several streets that terminate at the site (Hooper Street, Hewes Street, Wallabout Street, Steuben Street, Grand Avenue, Ryerson Street, and Hall Street).

Views, however, are frequently restricted by grade changes, fencing, the bulk of buildings themselves, and such visual barriers as the BQE viaduct. There are no views of the waterfront, either from the site itself or from the streets surrounding it.

The western border of the site at Flushing Avenue presents the (inactive) gate to NAVSTA Brooklyn and the seven-story brick lab building, with its distinctively curved and fenestrated corners, and twin radio masts on its roof (Photo 2). To the east of the gate, the lab and foundry buildings are partly obscured by two undistinguished, two-story administrative buildings. The foundry, a three-story structure of the same 1942 vintage as the adjacent lab, also presents distinctive fenestration, especially on its mostly glass south wall.

Further to the east, along Flushing Avenue, the 12-ft (3.7-m) high chainlink perimeter fence permits views into this western industrial sector. However, before reaching the hospital gate house, there is a grade change within NAVSTA Brooklyn so that east of the gate house the mesh-with-lathe fence sits above a stone retaining wall that ranges from three ft (0.9 m) to 12 ft (3.7 m) high, restricting all street-level views of the hospital campus area until reaching the southeast corner of the site (BQE frontage) (Photo 3). At this corner, the motion-picture office and the Bachelor Enlisted Quarters buildings are at street grade, enclosed behind the 12-ft- (3.7-m-) high mesh fence.

Partial vistas of the Naval Hospital and its campus can be had through sections of the fence along Williamsburg Street West, or from vehicles on the westbound BQE, looking across the open grassy areas of the Naval Hospital Cemetery and ballfields (Photos 4 and 5). Some partial views of the campus are also possible from the streets perpendicular to NAVSTA Brooklyn (Photo 6 shows part of the hospital, beyond the BQE on embankment, from Wallabout Street near Bedford Avenue).

Off-Site Neighborhood Character

A discussion of land use in the half-mile (0.8-km) radius study area is presented in Subchapter 3.1.1 and is shown in Figure 3.1-2. The study area comprises several distinct subareas with very mixed land use characters. Industrial and warehouse uses predominate in the blocks immediately surrounding NAVSTA Brooklyn, including the BNYDC-operated Navy Yard. Many of these building exhibit their 19th- century origins and are varied one- to nine-story structures (Photo 7). Industrial and warehousing activities are also interspersed with residences on the next upland block between Park and Myrtle Avenues, particularly in the eastern portion of the study area on the low-lying land that, in the 19th century, was served by the Wallabout Canal. Park Avenue, carrying the BQE on structure, acts as a visual barrier (Photo 8) and border with the mostly industrial district between it and the Navy Yard.

Several residential neighborhoods occupy the higher elevations. To the northeast of the site, the Satmar Hasidic Jewish community of Williamsburg is quite distinct, with its frequency of yeshivas and temples and the dress of its orthodox residents. Much of this neighborhood west of the BQE was the subject of recent urban renewal, so that its general appearance is of modern residential buildings

ranging in character from 24-story towers to three-story rowhouses. To the east of the BQE, this Williamsburg section comprises mostly older walk-up tenements (Photo 9). Population in the area has been growing and the Hasidic section is expanding into the industrial sections at its southern border. The neighborhood is served by the vibrant retail strip on Lee Avenue (Photo 10). In the southwest of the study area, the Walt Whitman Houses (Photo 11) occupy public housing "superblocks" with 3,500 units in 13- and 6-story towers that form a distinct community. This area has generally lower socioeconomic characteristics than the Clinton Hill neighborhood to the east.

Clinton Hill is characterized by numerous blocks of historic brownstone rowhouses, and includes the Catholic Bishop's residence, St. Joseph's College, and Pratt Institute (Photo 12). Its streets tend to be tree-lined and its homes well-kept. Further to the east, the continuity of brownstone rowhouses gives way to a more eclectic mix of residential styles, including the three 16-story towers of Willoughby Houses, and a more undistinguished mix of residential styles, where frame dwellings, vacant lots, walk-up tenements, and industrial/commercial buildings are interspersed (Photo 13). Myrtle Avenue is the commercial area serving this neighborhood, characterized mostly by stores located on the ground floors of walk-up residential tenements (Photo 14).

A detailed description of the study area's socioeconomic characteristics is provided in Subchapter 3.2. In broad terms, the residential areas are quite densely populated, particularly the high-rise sections of Williamsburg and Fort Greene at the study area's northeastern and western edges, respectively. The study area's total population in 1990 was 51,923, an increase of ten percent from 1980. The study area has several distinctive racial concentrations: the white Hasidic population in Williamsburg; a concentration of African-Americans in the Clinton Hill and broader Fort Greene sections; and a concentration of Hispanics between these two communities, in the eastern part of the study area.

The study area also has relatively high proportions of low-income persons, with 40 percent of all persons recorded below poverty in the 1990 census, a rate twice that of the city as a whole. Nonetheless, there is a concentration of relatively higher-income persons in the Clinton Hill section, where percentages of home ownership are higher than the city average. Employment in the zip-code areas surrounding the site is mostly in manufacturing (38 percent), with services next in significance (16 percent). In the quarter-mi (0.4 km) radius study area used for non-resident open-space analysis, there were almost 8,000 jobs recorded in the 1990 census transportation files.

In summary, existing neighborhood characteristics in the study area are diverse, reflecting two centuries of development in close proximity to the core of the New York metropolitan region. In particular, the waterfront activities of the Brooklyn Navy Yard created a working waterfront of historic significance. The NAVSTA Brooklyn site is itself considered two National Register-eligible historic districts by the SHPO. The BQE, on structure, is a major physical landmark, generally circumscribing the active industrial sectors of the study area and acting as a boundary to the more residential sections.

One exception, in the northeast of the study area, is where the BQE bisects the distinctive Hasidic community of South Williamsburg. To the west of the BQE, this community occupies largely modern publicly-assisted housing; to the east are older tenement blocks intensively occupied by residents of this orthodox community. Other distinctive residential communities include the historic brownstone rowhouses of Clinton Hill and the massive public-housing complex of Walt Whitman Houses. The study area's only major exception to its generally low-income status is the Clinton Hill neighborhood, which is occupied by middle- and upper-middle-income households in a racially integrated pattern.

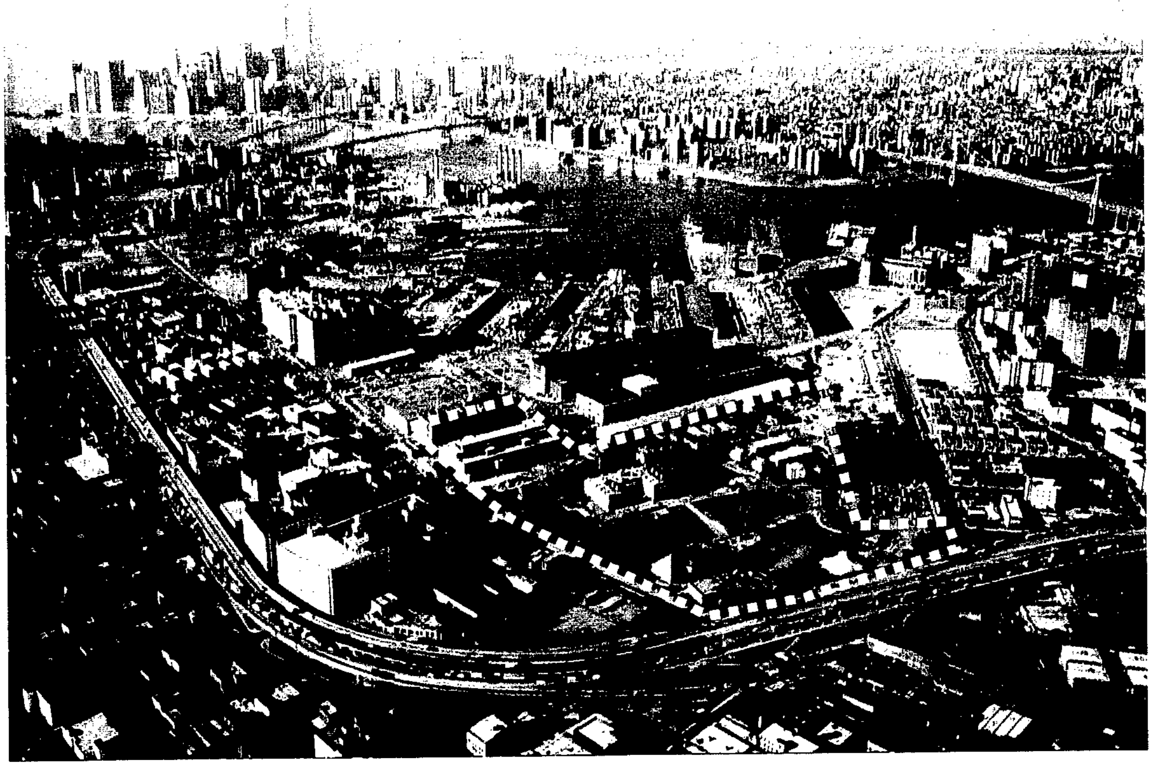


Photo 1. Aerial view of NAVSTA and surrounding area.

Photo 2. NAVSTA gate on Flushing Avenue and Lab Building.

Photo 3. Fence and wall on Flushing Avenue.

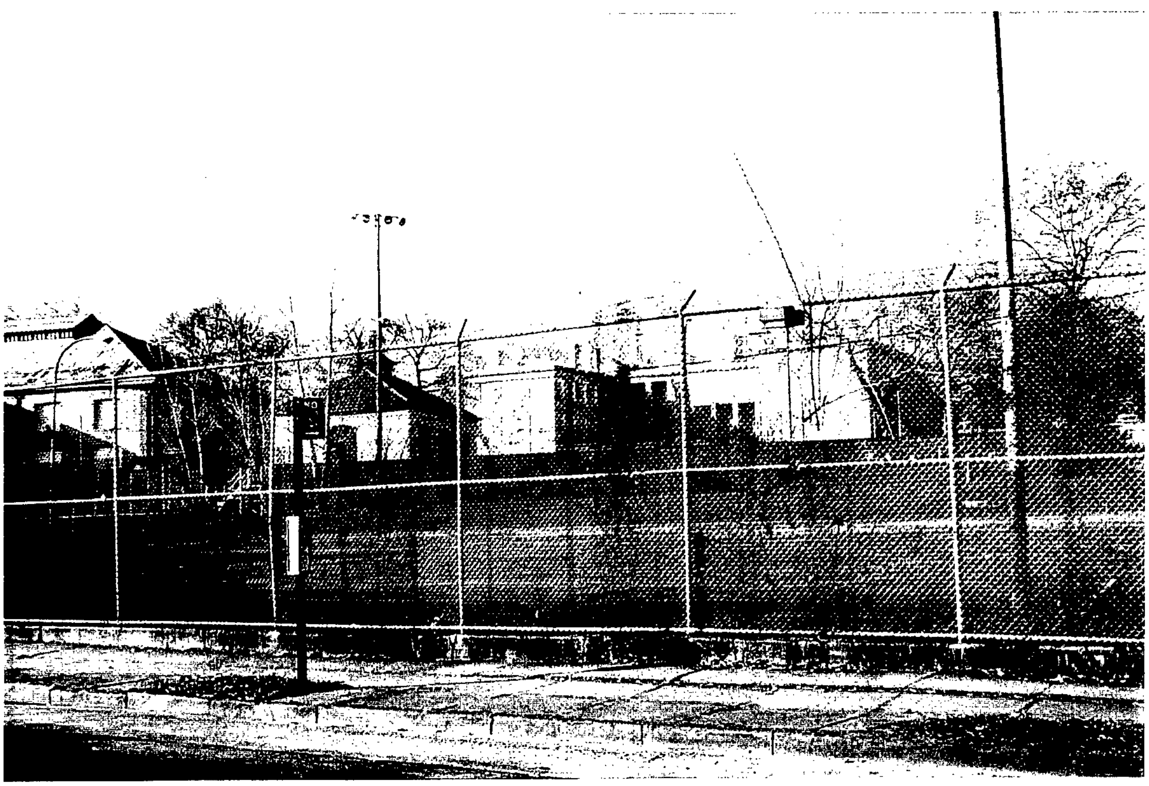


Photo 4. Cemetery and Naval Hospital from Williamsburg Street West.

Photo 5. NAVSTA property line at Kent Avenue.

Photo 6. View of NAVSTA from Wallabout Street and Lynch Street, Brooklyn-Queens Expressway on embankment.

Photo 7. Industrial warehouse buildings on Flushing Avenue at Cumberland Street.

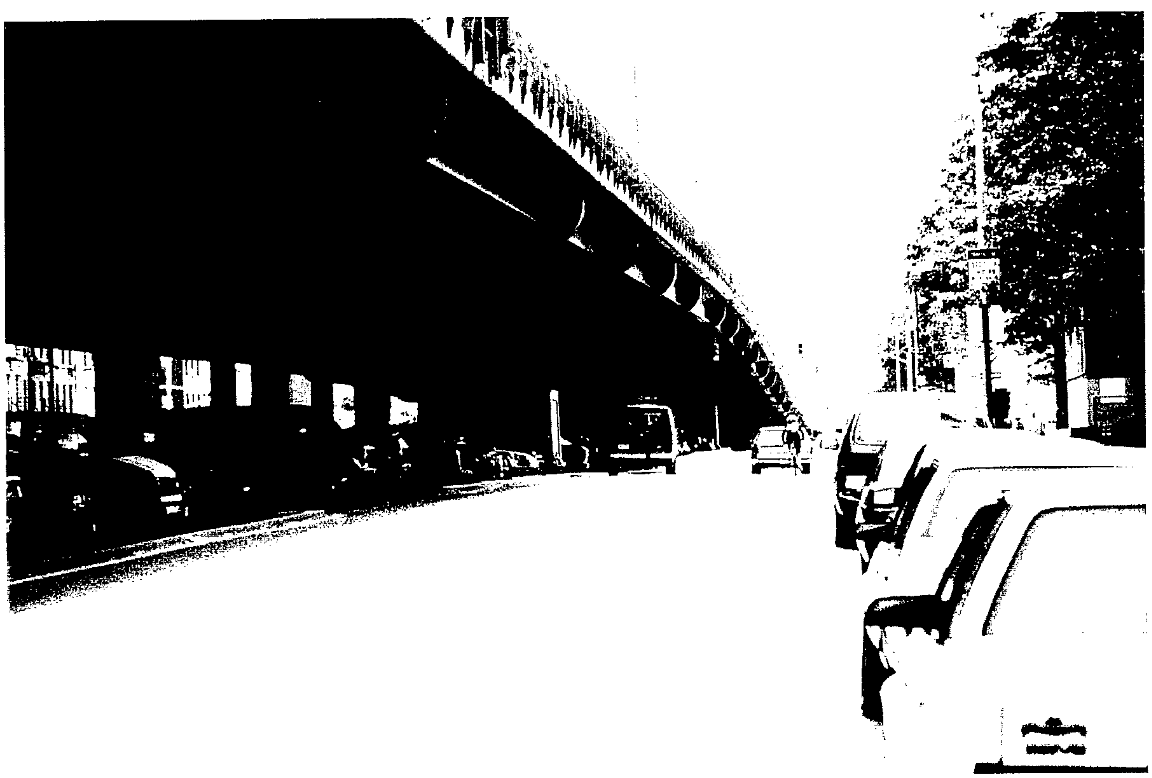


Photo 8. Brooklyn-Queens Expressway's elevated structure at Park Avenue.

Photo 9. A typical older tenement section in South Williamsburg.

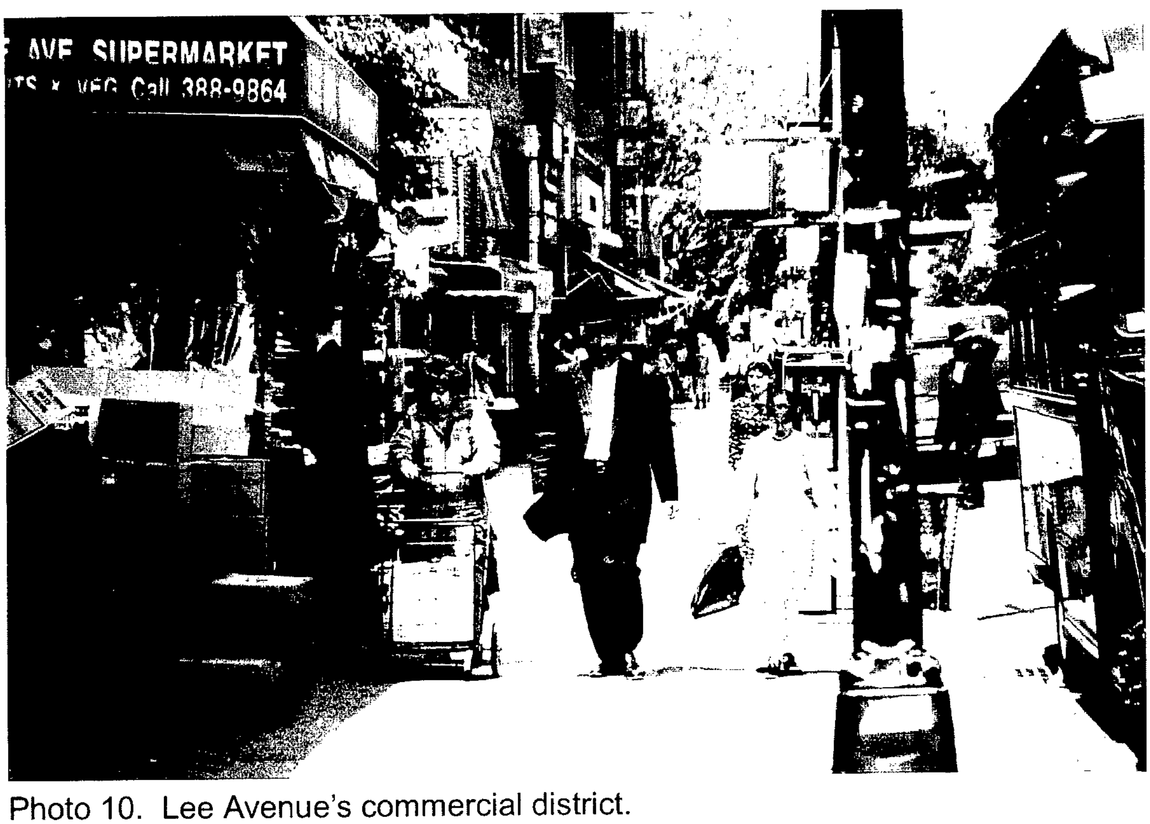


Photo 10. Lee Avenue's commercial district.

Photo 11. Walt Whitman Houses.

Photo 12. Clinton Hill brownstones on Clermont Avenue.

Photo 13. Residential area on Franklin Avenue.

Photo 14. Myrtle Avenue's commercial district.

3.2 Socioeconomics

The study area for the review of existing socioeconomic conditions is defined based upon the geographic availability of demographic and economic data, and has been analyzed in the context of the borough of Brooklyn (Kings County) and the city of New York, NY. The study area extends 0.5 mi (0.8 km) from NAVSTA Brooklyn, conforming to census tract boundaries and encompassing 18 entire census tracts (Figure 3.1-1). Table 3.2-1 summarizes selected demographic and economic conditions; Appendix B contains detailed tables for all criteria outlined in this section for the study area, Brooklyn, and New York City.

3.2.1 Demography

The population of the study area was 51,923 in 1990 (Table 3.2-1), an increase of 4,829 persons, or 10.3 percent, from the 1980 population of 47,094 (Appendix B, Table B-1). Of the 18 census tracts, five exceeded the overall population increase rate of the study area. Most population growth occurred in tracts to the northeast of the site (tracts 533, 535, 537, 539, and 545) in the area occupied mostly by orthodox Jews (Satmar Hasidim), the area around Pratt Institute (tract 193), and a mixed-use section between Park and Flushing Avenues (tract 185.02). By contrast, five census tracts decreased in population, although loss of numbers occurred mostly in tracts 191 and 183 to the southwest of the site. Also included among the declining areas was the site itself (part of tract 543), which lost its resident Navy personnel; tract 543 includes the entire Brooklyn Navy Yard, which in 1990 had no resident population.

Population data for the wider contexts of Brooklyn and New York City are also shown in Appendix B for comparative purposes. The population of the study area increased at rates substantially greater than both Brooklyn and New York City: during the period of 1980 to 1990, the population of Brooklyn increased by 3.1 percent and the population of New York City increased by 3.5 percent, while the study area's population increased 10.3 percent (Appendix B, Table B-1).

Projections of future populations for the year 2002, the project's prospective buildout year, indicate a population decrease, over the period 1990-2002, of 999, or 1.9 percent, for the study area (Claritas Data Services, 1997). A total of 12 census tracts are projected to decline in population, twice the number that experienced decline in the 1980s. Claritas projections for the year 2002 indicate that the population of Brooklyn will decrease 3.1 percent, while the population of New York City is projected to increase 0.7 percent.

Age distributions of the 1980 and 1990 populations for the census tracts, study area, Brooklyn, and New York City are shown in Appendix B, Table B-2, and the median age is shown in Table 3.2-1.

Table 3.2-1

Demographic and Economic Conditions[1]

Socioeconomic Aspect		Study Area	Brooklyn	New York City
Total Population, 1990		51,923	2,300,664	7,332,564
Median Age, 1990		25.0	30.9	32.8
Ethnic Characteristics, 1990	Percent Black	30.1	34.7	25.2
	Percent Hispanic	24.6	20.1	24.4
Income Data, 1990 (from 1989 Census)	Per Capita Income	8,016	12,318	16,230
	Percent Persons Below Poverty Line	40.3	22.6	19.3
Total Households, 1990		14,933	828,199	2,819,401
Mean Household Size, 1990		3.45	2.74	2.54
Labor Force, 1990		33,763	1,760,921	5,817,015
Median Housing Rent $, 1990		377	428	448

Notes: [1]See Appendix B for more detailed tables.
Source: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995; Projections based on Claritas Data Services, Household Trend Report, 1997; Demographic Profiles, 1990: 1992; NYC Dept of City Planning, 1992.

The study area population had a larger proportion of young persons than both Brooklyn and New York City. In 1990, 43 percent of the population in the study area was under the age of 18, compared to Brooklyn with 26 percent and New York City with 23 percent; these numbers represent a slight decline in the youth population in the borough and city, and a growth of 13 percent in the study area, most notably in tracts 533, 535, and 537. On the other hand, the percentage of the population in the study area over the age of 65, eight percent, was less than for the respective age group in both Brooklyn (12.4 percent) and New York City (13 percent). The proportion of elderly essentially remained the same in the study area, Brooklyn, and New York City over 1980-90.

Table 3.2-1 shows the 1990 racial and ethnic composition of the study area (see Appendix B, Table B-3 for more detailed information). While some tracts have notable concentrations of racial and ethnic groups, other tracts in the study area are more integrated. Overall, in 1990, the black (persons having origins in any of the black racial groups of Africa) population was 30 percent of the total population, but was particularly concentrated in tracts to the south and southwest of the site. In 1990, Hispanic persons represented 24.6 percent of the population, and were predominant in tracts to the southeast, although also substantially represented in tracts to the southwest. The white, non-Hispanic population was concentrated in the area to the northeast of the site, but was also notably represented in tracts 193 and 195, which are in the area around Pratt Institute known as Clinton Hill.

Compared to the black populations of Brooklyn and New York City in 1990, the proportion of blacks in the study area was less than in Brooklyn, which was 34.7 percent, and greater than New York City, which was 25.2 percent. The proportion of Hispanics in the study area was greater than the proportion of Hispanics in Brooklyn (20.1 percent), and nearly identical to the percentage of Hispanics for New York City (24.4 percent).

3.2.2 Income

Income data for the study area, Brooklyn, and New York City for 1990 are shown in Appendix B, Table B-4. In general, the median household income, the median family income, and the per capita income were lower in the study area tracts than for both Brooklyn and New York City (Table 3.2-1). Among the 18 census tracts comprising the study area, four had a median household income greater than Brooklyn and four were greater than New York City for the same category. These higher-income areas were the tracts of Clinton Hill (Pratt Institute and its surrounding brownstone blocks).

Tracts with particularly low incomes were 185.01 (mostly Walt Whitman public housing) and 185.02 to the southwest of the site, and the tracts to the southeast and northeast of the site, including the area of Williamsburg occupied mostly by the Satmar Hasidim. Rates of poverty were high in the study area, with 40.3 percent of persons below the poverty line, compared to 22.6 percent for Brooklyn and 19.3 percent for New York City. Only three census tracts, in Clinton Hill, had poverty rates lower than for Brooklyn as a whole.

3.2.3 Housing

In 1980, there were 16,232 housing units in the 18-census tract study area. By 1990, the total number of housing units in the study area slightly decreased by one percent to 16,052 (Appendix B, Table B-4; Table 3.2-1). This decrease closely mirrors the nearly one-percent decrease in housing units for Brooklyn as a whole during the same period. By contrast, the number of housing units increased 1.7 percent in New York City during this period. Within the study area, few tracts experienced an increase in the numbers of units; tract 539, to the northeast of the site, saw 164 new units created over the period. More recent field observations show continued growth of new infill housing in this area, which is part of the Williamsburg I Urban Renewal Area. The other area that showed some modest growth was around Pratt Institute, where 220 units were created in tracts 193 and 195. Notable declines in the number of units were recorded in tracts 183, 237, and 531.

Data on the number of households generally match the trends exhibited with respect to the number of housing units, with an overall decline of 0.8 percent in the study area over the period. By comparison, the number of households remained the same in Brooklyn as a whole, and increased by 1.1 percent for the city. Only three tracts experienced a decline in mean household size over 1980-90, with the remainder generally experiencing rates of increase greater than the 2.6 percent for Brooklyn and two percent for the city over the same period. Particularly notable increases in household size occurred in the Williamsburg tracts to the northeast of the site. Projections for the year 2002 continue these trends with a growth in mean household size forecast for most of the tracts in the study area, maintaining their position with larger households than Brooklyn or the city as a whole (Claritas Data Services, 1997).

In general, the percentage of housing units that were owner-occupied in the study area in 1990 was less than in Brooklyn (Table 3.2-1; Appendix B, Table B-6); in fact, only two tracts had a greater proportion of housing occupied by owners than Brooklyn. However, nine tracts had either an equal or greater proportion of owner-occupied housing units than New York City.

The owner-occupied housing is centered on the brownstone areas of Clinton Hill but extends to the northeast of the study area. The highest rate of owner-occupancy is in tract 193 (Pratt Institute area) with 46 percent. Consequently, the inverse indicator of renter-occupancy is in the majority in all tracts, with 13 of the 18 tracts exceeding the 74 percent renter-occupied rate for the borough as a whole.

Vacancy rates in 1990 varied significantly around the study area. The mean percent of units for sale in New York City was 2.9 and in Brooklyn was 2.8; in the study area six tracts exceeded these rates, and the other tracts were notably less. The vacancy rate for rental units in New York City was 5.8 and in Brooklyn was 5.2 percent; among the study area tracts, eight exceeded these rates. Generally, these were located in a swath of mixed-use blocks surrounding the project site.

Median housing values in the study area for 1990 ranged from $30,000 in tract 539 to $290,000 in tract 195 (Appendix B, Table B-6). Only two tracts (tracts 183 and 195) had a greater median housing value than both Brooklyn ($196,100) and New York City ($189,600). These two tracts, representing the Clinton Hill brownstone area, would surely be joined by tract 193 (Pratt Institute area) but no census data on values are provided in 1990 for this tract. Median monthly gross rent levels in the study area ranged from $191 in tract 185.01 to $563 in tract 183. Five tracts in the study area had a greater median monthly gross rent than both Brooklyn and New York City. The higher-rent areas are generally the same Clinton Hill brownstone areas noted already. Low-priced rental housing is located in the public housing of tract 185.01 (to the southwest of the site) as well as in the Williamsburg neighborhood to the northeast of the site. The study area can be characterized as having both low-income and upper-income housing opportunities.

3.2.4 Employment and Earnings

The 1990 census data on the resident labor force and employment are shown in Table 3.2-1 (see Appendix B, Table B-7 for further details). As can be seen, the study area had a labor force of 33,763 (persons 16 years and older), and 50.5 percent of persons 16 years and older were in the labor force. Overall, the proportion of persons in the labor force was less in the study area than for Brooklyn as a whole (58.3 percent), and New York City (61.5 percent). Higher labor force participation occurred in the Clinton Hill area, and the lowest rates generally occurred in the Satmar neighborhood of Williamsburg.

The unemployment rate in the study area's labor force was 10.3 percent, equal to the Brooklyn unemployment rate, and slightly higher than the unemployment rate for New York City, which was nine percent. Higher rates of unemployment tend to occur in the swath of mixed-use tracts between the Navy Yard and Myrtle Avenue.

Data on earnings and the number of employees, by major industry and at the county level, are available from the US Bureau of Economic Analysis (BEA), Regional Economic Information System, and are shown for the years 1993-95 in Appendix B, Tables B-8 and B-9. Per capita earnings over this period increase from $19,196 to $21,328, an 11.1 percent gain over two years. Earnings in major industry sectors are, in declining order:

- Services, which, as the greatest source of earnings in the county, account for 42.6 percent of all 1995 non-farm earnings;
- Government, at 10.9 percent;
- Manufacturing, at 9.5 percent;
- Retail trade, at 8.5 percent;
- Finance, insurance, and real estate (FIRE), at 8.1 percent;
- Transportation and utilities, at 7.8 percent; and
- Wholesale trade, at 8.5 percent.

Somewhat different rankings of the number of employees by industry sector can be seen in Appendix B, Table B-9, where, for example, government shifts to fifth place, implying relatively greater earnings in this sector than employment.

Data on employment for a smaller geographic area than the county as a whole are available from the New York State Department of Labor at the zip code level and are shown in Table 3.2-2. This table shows data for the three zip codes surrounding the site:

- 11211, which includes most of the Navy Yard, the site, and much of the area of Williamsburg extending northeast of the site;

- 11206, the area to the southeast and including a substantial portion of the Bedford-Stuyvesant neighborhood; and

- 11205, which includes the Fort Greene-Clinton Hill neighborhoods.

These three zip codes extend further from the site, mostly to the east, than the half-mile radius used elsewhere, but they provide the best local data on employment by industry category in the area. The table also shows comparable data for Brooklyn and New York City in 1996.

For the three zip codes, overall employment is recorded at 43,265 jobs in 1996. Of this total, 38 percent are employed in manufacturing, a much greater percentage than for Brooklyn (12.7 percent) and the city (9.4 percent). Among the three zip codes, manufacturing accounts for 41 percent, 42 percent, and 35 percent of employment for zip codes 11205, 11206, and 11211, respectively. The next largest industry category in the study area is services, accounting for 16.3 percent, a much smaller percentage than for Brooklyn (44.8 percent) or the city (42.8 percent). The next-ranking employment categories in the study area are construction and wholesale trade (both about nine percent), which exceed the borough and city levels for these industries. The study area can thus be characterized, in employment terms, as much more blue-collar than the borough or city as a whole.

Among the three zip codes, 11211 (Navy Yard and south Williamsburg) generates almost half of total employment (47.3 percent) and exceeds this proportion in the following industries: FIRE, 65 percent; wholesale trade, 63 percent; construction, 62 percent; services, 55 percent; and transportation and utilities, 53 percent.

Zip code 11205 has a high concentration of employment in transportation and utilities, which account for 41.5 percent of all this sector's employment in the three zip-code area, and 11206 has no industries that are dominant in the study area.

Table 3.2-2

Employment by Industry and Zip Codes, Fourth Quarter 1996

Industry	Number of Firms				Persons Employed (by zip code)[1]								
	Zip Code				Zip Code					Brooklyn		NYC	
	11205	11206	11211	Subtotal	11205	11206	11211	Subtotal	% of Total[2]	As a Whole	% of Total	As a Whole	% of Total
Construction	44	43	126	213	842	625	2,434	3,901	9.0	18,861	4.9	93,088	3.3
Manufacturing	141	179	342	662	4,053	5,386	7,099	16,538	38.2	49,167	12.7	264,436	9.4
Transportation & Public Utilities	26	18	61	105	545	75	692	1,312	3.0	24,443	6.3	204,348	7.2
Wholesale Trade	71	83	216	370	484	973	2,431	3,888	9.0	27,411	7.1	181,397	6.4
Retail Trade	104	196	338	638	633	1,099	1,352	3,084	7.1	62,949	16.3	387,592	13.7
FIRE	25	35	133	193	216	134	659	1,009	2.3	26,191	6.8	466,613	16.5
Services	112	115	239	466	466	2,716	3,849	7,031	16.3	173,314	44.8	1,210,802	42.8
Unclassified	20	22	51	93	136	110	141	387	0.9	4,476	1.2	20,721	0.7
Total	543	691	1,506	2,740	9,849	12,947	20,469	43,265	100.0	386,813	100.0	2,828,998	100.0

Notes: [1] Data for employment in a number of industry categories is suppressed by NYS DoL to maintain confidentiality where the number of firms is very small. Overall totals are provided by NYS DoL but totals by industry category do not include the suppressed data.
[2] Percentages are computed based on industry totals that exclude the suppressed data, however, the overall total does include otherwise suppressed data, consequently percentages will not add to 100 percent.

Source: Unpublished NYS Dept. of Labor (DoL), ES 202 data, 1996.

3.3 Community Facilities and Services

3.3.1 Education

The study area, depicted in Figure 3.1-1, contains portions of Brooklyn Community School Districts 13 and 14, with a total of nine public schools (five elementary schools, three junior high schools, and one high school). Public school enrollment and utilization levels during the 1996-1997 school year are shown in Appendix C, Table C-1. The locations of all schools are shown on Figure 3.3-1, Community Facilities. With the exception of Public School (PS) 20, enrollment in all of the public schools within the study area is below capacity.

There are also 24 private/parochial schools, consisting of 12 elementary schools, two junior/senior high schools, two senior high schools, and eight schools serving grades K-12. The majority of these schools are Yeshiva and are primarily located in the Satmar Hasidic section of Williamsburg, in the northeast part of the study area. Enrollment data for these private/parochial schools are shown in Appendix C, Table C-2.

Two institutions of higher education are located within the study area:

- Pratt Institute, 200 Willoughby Avenue, with a 1995 enrollment of 2,975; and
- St. Joseph's College, 245 Clinton Avenue, with a 1995 enrollment of 1,343.

In addition, while not located within the study area, Long Island University, Brooklyn Campus; St. Francis College; Brooklyn Law School; Polytechnic University; New York City Technical College (City University of New York [CUNY]); the Institute of Design and Construction; and the College of New Rochelle, Brooklyn are all within 1.5 miles (2.4 km) of the study area.

3.3.2 Health Care

While there are no hospitals within the study area, it is served by two hospitals that are in close proximity. The Brooklyn Hospital Center, a private not-for-profit hospital, is 0.25 miles (0.4 km) west of the study area. Woodhull Medical Center, a facility of the New York Health and Hospitals Corporation (NYHHC), is located about 0.25 miles (0.4 km) east of the study area. Table C-3 in Appendix C provides the number of licensed beds and recent occupancy rates for both of these hospitals.

3.3.3 Emergency Services

Police

The site is presently under the jurisdiction of the Department of the Navy. but, when disposed of, the site would come under the jurisdiction of the NYC Police Department and the service area of its 88th Precinct. The 88th Precinct has 156 police officers and 22 civilian personnel at its station house, 298 Classon Avenue, about 0.5 miles (0.8 km) to the south of the site (Figure 3.3-1). This precinct serves the western portion of the study area and the eastern section of Community District (CD) 2. In addition to the 88th Precinct, police services in the study area are provided by:

- The 90th Precinct, at 211 Union Street in Williamsburg in CD 1, with 275 officers and 25 civilians (also the command HQ for Brooklyn North); and
- The 79th Precinct, at 263 Tompkins Avenue in Bedford-Stuyvesant in CD 3, with 220 officers and 18 civilians.

Fire

Fire protection services are provided by three NYC Fire Department facilities located within the study area:

- Engine Company 211 and Ladder 119, 26 Hooper Street. This facility is the closest to the study area and is located directly across Kent Avenue to the northeast from the site;
- Engine Company 210, 160 Carlton Avenue, is about 0.5 miles (0.8 km) southwest of the site; and
- Engine Company 209 and Ladder 102, 850 Bedford Avenue, are about 0.3 miles (0.5 km) southeast of the site.

3.3.4 Libraries

There are no public libraries located within the study area; however, four libraries are in close proximity (Figure 3.3-1). These are Williamsburg Library (map reference #1) to the northeast; Marcy Library (map reference #2) to the southeast; Clinton Hill Library (map reference #3) to the south; and Walt Whitman Library (map reference #4) to the southwest. Library addresses and circulation data are provided in Table C-4 in Appendix C.

Community Facilities

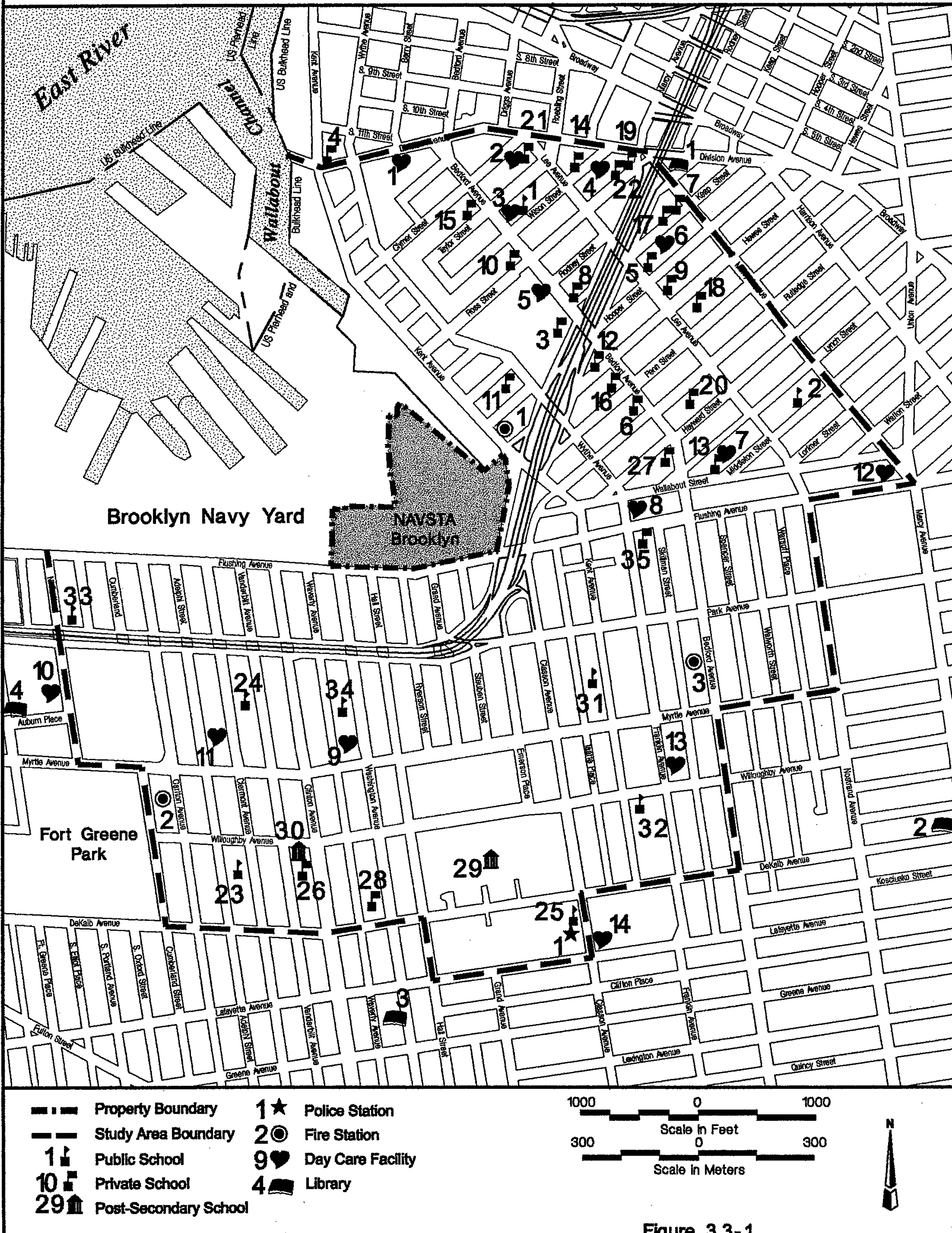


Figure 3.3-1

Legend For Figure 3.3-1

Community Facilities

Map#	Facility
	Public Schools
1	P.S. 16 Leonard Dunkly School
2	P.S. 380
23	P.S. 20 Clinton Hill School
24	P.S. 46 Edward C. Blum School
25	P.S. 270 Dekalb School
31	P.S. 157 Franklin School
32	I.S. 117 Francis Scott Key
33	I.S. 265 S.S. McKinney
34	Benjamin Banneker Academy for Community Development
	Private Schools
3	Bais Yaakov Dkhal Adas Veriem
4	Be Ikvei Hatzoin
5	Bnos Chavil
6	Talmud Torah Toldos Hillel-Krasna
7	United Talmudical Acad
8	Yeshiva Bnos Spinka
9	Yeshiva Yesode Hatorah
10	Yeshiva Yesode Hatorah
11	Mashiva Beth Yehuda Chaim Dbetlan
12	Yeshiva Beth Yitzchok D. Spinka
13	Yeshiva Mesivta Arugath Habosem
14	Meshiva Nachlas Yacovha
15	Yeshiva Bnai Vesucher Ber
16	Beth Chana School for Girls
17	Beth Rachel School for Girls
18	Bnei Shimon Yisroel of Sopron
19	Bnos Yakov School for Girls
20	Talmud Torah Toldos Yakov Yosef
21	Yeshiva Ahavas
22	Yeshiva Kehilah Yakov
26	Dillon Child Study Center
27	Bnos Chayil
28	St. Angela Hall ES
	Higher Education
29	Pratt Institute
30	St. Josephs College

Legend For Figure 3.3-1, Con't.

Community Facilities

Map#	Facility
	Day Care Facilities
1	YM-YWHA of Williamsburg, Inc.
2	Torah DCC
3	Graham-Windham CCC
4	Yeshivath Kehilah Yakov HS
5	Yeled V'Yalda HS Center
6	Yeled V'Yalda HS Center
7	Howard O Walker DCC
8	Yeled V'Yalda HS Center
9	Willoughby Waverly DCC
10	BBCS Child CCC
11	Oasis for Children
12	Marcy Childrens Center
13	David T. Bradley Memorial DDC
14	Billy Martin CDC
	Police
1	88th Police Precinct
	Fire Stations
1	Engine 211 Ladder 119
2	Engine 210
3	Engine 209 Ladder 102
	Libraries
1	Williamsburg Library
2	Marcy Library
3	Clinton Hill
4	Walt Whitman

3.3.5 Day Care Facilities

Fourteen day care facilities are located within the study area; in 1995, these provided 1,188 "slots" for children. Eight of these are located in the Williamsburg section and are mostly affiliated with religious institutions. Figure 3.3-1 shows the locations of all the day care facilities and Table C-5 in Appendix C identifies the addresses, type of facility, and capacity.

3.3.6 Parks and Recreation

There are numerous small parks, playgrounds, and triangles located within the study area, as shown in Figure 3.3-2, Parks, and Table 3.3-1, which uses a 0.5-mile (0.8-km) radius from the site (as shown in Figure 3.1-1). The largest recreation area is the 3.15-acre (1.25-hectare) Classon Playground, located at Flushing Avenue and Williamsburg Place. The total acreage of parks and recreation areas within the study area is 20.63 acres (8.3 hectares), providing a ratio of 0.4 acres (0.16 hectares) of open space per 1,000 residents. The area is thus relatively underserved compared to the citywide survey that indicated half of the community districts have an open-space ratio of 1.5 acres (0.6 hectares) per 1,000 residents, or the city planning goal of 2.5 acres (one hectare) per 1,000 residents (NYC CEQR Technical Manual, 1993 p3D-4).

The CEQR analysis also requires calculation of a user ratio for non-resident users (for this EIS, primarily workers), and suggests a study area with a radius of 0.25-miles (0.4 km) from the site, conforming to census tract boundaries. The worker population is estimated using data from the 1990 census provided by the NYC DCP. Table 3.3-2 shows the relevant census tracts and the number of workers. Of the total 7,892 workers, a small but unidentified number work at home but are here counted as part of the non-resident worker population.

Table 3.3-3 modifies the open-space resource inventory to reflect the 0.25-mile (0.4-km) radius study area for the non-resident analysis. The focus for this group is more on the availability of passive space, and the CEQR Technical Manual notes that a ratio of 0.15 acres (0.06 hectares) per 1,000 non-residents is desirable. Table 3.3-3 shows there are 2.09 acres (0.8 hectares) of passive-oriented space existing in the modified study area. Dividing this amount of passive space by the worker population gives a ratio of 0.26 acres (0.10 hectares) per 1,000 workers, a ratio that exceeds NYC DCP goals for this indicator.

Additional open-space resources in proximity to the larger (0.5-mile [0.8-km] radius) study area include four relatively large parks or recreation areas totaling 51.7 acres (20.9 hectares):

- Fort Greene Park (30.2 acres [12.2 hectares]) is located on the southwest boundary of the study area;

- Commodore Barry Park (10.4 acres [4.2 hectares]) is immediately beyond the western boundary of the study area;

- Marcy Houses Playground (3.2 acres [1.3 hectares]) is on the southeastern border of the study area; and

- Herbert Von King Park (7.8 acres [3.2 hectares]) lies further to the southeast.

Parks

Property Boundary

Study Area Boundary

1 ● Park

1000 0 1000

Scale in Feet

300 0 300

Scale in Meters

N

Figure 3.3-2

Table 3.3-1

Parks and Recreation Facilities within 0.5-mile Radius

Name (Map Key Number)	Address	Type	Acres (Hectares)	Percent		Features	Condition
				Passive	Active		
Park/Roberto Clemente ballfield (1)	Clymer St, Wythe & Kent Aves	Park	4.0 (1.62)	20	80	Ballfield recently opened, additional southern park still under construction	Good
PS 16/ Roebling Plgd (2)	Wilson, Lee Aves, Taylor St	Park	1.22 (0.49)	10	90	Handball and shuffleboard courts, MPPA, basketball backboards, softball, storage bldg	Fair
Middleton Plgd (3)	Lynch, Middleton Sts, Lee Ave	Plgd	1.10 (0.45)	25	75	Softball, handball, and basketball courts, storage bldg, new plgd. eqipt	Good
Classon Plgd (4)	Flushing Ave, Williamsburg Pl	Rec. Area	3.15 (1.27)	5	95	Basketball, horseshoe, and handball courts, storage bldg	Fair
Harold W. Cohn Memorial Square (5)	Bedford Ave, Division Ave	Tri	0.07 (0.03)	100	0	Fenced, grass triangle w. flagpole, no public access	Fair
Louis Sobel Park (6)	Lee, Division Aves, Roebling St	Tri	0.13 (0.05)	100	0	Fenced, trees, no public access	Poor
Park (7)	Keap, Rodney Sts, Bedford, Lee Aves	Tri	0.06 (0.02)	0	0	Occupied by religious-food vendor	Poor
Sitting Area (8)	Kent, Classon Aves, Wallabout St	Tri	0.2 (0.08)	100	0	Trees, benches	Fair
Sitting Area (9)	Penn St, Wythe Ave	Tri	0.18 (0.07)	100	0	Trees, benches	Fair
Albert Lysander Parham Plgd (10)	Adelphi St to Clermont Ave	Plgd	1.25 (0.50)	10	90	Handball and basketball courts, softball, pool, MPPA, storage bldg, picnic tables	Good

Table 3.3-1 (cont.)

Parks and Recreation Facilities within 0.5-Mile Radius

Name (Map Key Number)	Address	Type	Acres (Hectares)	Percent		Features	Condition
				Passive	Active		
Steuben Plgd (11)	Flushing, Classon, Park Aves	Plgd	1.45 (0.59)	10	90	Handball and basketball courts, softball, MPPA, storage bldg	Fair
Plgd (Pratt) (12)	Willoughby Ave, Emerson Pl	Plgd	0.91 (0.37)	20	80	Handball and basketball courts, softball field, MPPA, storage bldg	Fair
Washington Hall Plgd (13)	Park, Washington Aves, Hall St	Plgd	0.90 (0.36)	20	80	Handball and basketball courts, MPPA, water fountain, garden, storage bldg	Good
PS 270 Plgd (14)	Lafayette, Classon Aves	Plgd	1.33 (0.54)	15	85	Handball and basketball courts, MPPA, storage bldg	Fair
PS 46 Edward C Blum Plgd (15)	Adelphi, Myrtle Aves	Plgd	0.68 (0.28)	10	90	Basketball court, MPPA, softball, water fountain, flagpole, storage bldg	Good
JW Person Triangle (16)	Myrtle, Carleton Aves	Tri	0.05 (0.02)	100	0		Fair
IS 117 (Star Spangled) Plgd (17)	Franklin, Willoughby, DeKalb Aves	Plgd	1.10 (0.45)	10	90	Handball and basketball courts, softball, MPPA, storage bldg	Fair
Playground (Taaffe)(18)	Park to Myrtle Aves, Taaffe Pl	Plgd.	1.82 (0.74)	10	90	Handball and basketball courts, softball, MPPA, storage bldg	Good
JHS 265 Plgd (19)	Flushing, N Portland Ave, N Oxford	Plgd	1.03 (0.42)	10	90	Basketball, volleyball, and tennis courts, chess tables, storage bldg	Good - Fair
TOTAL			17.47 (7.07)				

Notes: Plgd = Playground; Tri = Triangle; Rec. Area = Recreation Area.

Table 3.3-2

Employment by Census Tract (1990)

Census Tract	Number of Employees
185.02	890
187	295
189	985
191	1,191
237	1,044
537	1,463
539	292
543	1,732
Total	7,892

Source: US Census 1990 CTTP, Urban Element Part II.

Table 3.3-3

Parks and Recreation Facilities within 0.25-mile Radius

Name (Map Key Number)	Address	Type	Acres (Hectares)	Percent		Features	Condition
				Passive	Active		
Park/Roberto Clemente ballfield (1)	Clymer St, Wythe & Kent Aves	Park	4.0 (1.62)	20	80	Ballfield recently opened, additional southern park still under construction	Good
Classon Plgd (4)	Flushing Ave, Williamsburg Pl	Rec. Area	3.15 (1.27)	5	95	Basketball, horseshoe, and handball courts, storage bldg	Fair
Harold W Cohn Memorial Square (5)	Bedford Ave, Division Ave	Tri	0.07 (0.03)	100	0	Fenced, grass triangle w. flagpole	Fair
Sitting Area (8)	Kent, Classon Aves, Wallabout St	Tri	0.2 (0.08)	100	0	Trees, benches	Fair
Sitting Area (9)	Penn St, Wythe Ave	Tri	0.18 (0.07)	100	0	Trees, benches	Fair
Steuben Plgd (11)	Flushing, Classon, Park Aves	Plgd	1.45 (0.59)	10	90	Handball and basketball courts, softball, MPPA, storage bldg	Fair
Washington Hall Plgd (13)	Park, Washington Aves, Hall St	Plgd	0.90 (0.36)	20	80	Handball court, basketball courts, MPPA, water fountain, garden, storage bldg	Good
PS 46 Edward C Blum Plgd (15)	Adelphi, Myrtle Aves	Plgd	0.68 (0.28)	10	90	Basketball court, MPPA, softball, water fountain, flagpole, storage bldg	Good
Playground (Taaffe) (18)	Park to Myrtle Aves, Taaffe Pl	Plgd.	1.82 (0.74)	10	90	Handball and basketball courts, softball, MPPA, storage bldg	Good
JHS 265 Plgd (19)	Flushing, N Portland Ave, N Oxford	Plgd	1.03 (0.42)	10	90	Basketball, volleyball, and tennis courts, chess tables, storage bldg	Good - Fair
TOTAL			13.48 (5.46)	2.09 (0.85)	11.39 (4.61)		

3.4 Transportation

3.4.1 Traffic

Local Street Network

The project site, located just north of the Fort Greene section of downtown Brooklyn, has as its boundaries the East River, Kent Avenue, Flushing Avenue, and Navy Street/Hudson Avenue. Regional access to the site is provided by the BQE (I-278).

Key roadways within the local study area include:

- Kent Avenue – Serving as a link between the site and the Williamsburg and Southside areas of Brooklyn, Kent Avenue provides access to the BQE and the Manhattan Bridge. In the study area, two travel lanes and one parking lane are provided per direction. Traffic volumes are low to moderate, with peak-hour one-way volumes reaching 700 vehicles per hour (vph). Two-way weekday volumes are approximately 1,400 vehicles per day (vpd) in the vicinity of Ross Street. Development along Kent Avenue is primarily industrial on the southbound side, and residential on the northbound side. Trucks account for approximately 16 percent of peak-hour traffic in the study area.

- Flushing Avenue – Serving as an access road, Flushing Avenue collects traffic from many north/south roads and delivers it to the site. One travel and one parking lane per direction are provided. Traffic volumes are relatively low, with peak-hour one-way volumes reaching 650 vph. Two-way volumes are approximately 9,500 vpd in the vicinity of the site. Trucks account for approximately 12 percent of peak-hour traffic.

- Park Avenue – Running parallel to Flushing Avenue, Park Avenue acts as a through route below the BQE in the study area. Cross-street traffic allows access to Flushing Avenue and the site. Two travel lanes and one parking lane per direction are provided. Within the study area traffic volumes along Park Avenue are moderate, with one-way volumes of 1,300 vph or less and two-way volumes of approximately 24,000 vpd. Trucks account for approximately six percent of peak-hour traffic in the study area.

- Clinton Avenue – Providing direct access to the Navy Yard, Clinton Avenue dead-ends in the facility. In the study area, one travel lane and one parking lane are provided per direction. Traffic volumes in the vicinity of Clinton Avenue are low, with one-way volumes of 120 vph and two-way volumes of 1,500 vpd. Trucks account for approximately 12 percent of peak-hour traffic.

Traffic Characteristics

Manual intersection turning movement and vehicle classification counts were collected at 15 locations on Tuesday, July 15, 1997, for am (6:30-9:30) and pm (3:30-6:30) time periods. Turning movement counts establish existing volumes of traffic moving on the street network. Vehicle classifications identify the types of vehicles (i.e., autos and light, medium, and heavy trucks) that use each link in the analysis network. Each of the intersections counted was also inventoried to identify those parameters used to determine the capacity of the intersection and its approaches, as specified by the Transportation Research Board's *Highway Capacity Manual* (HCM), 1994.

Concurrent with the traffic volume data collection effort, travel speed and delay runs were conducted along Kent Avenue, Flushing Avenue, and Park Avenue. Appendix D, Table D-1 presents the approximate volume, volume/capacity (V/C) ratio, stopped delay, and level of service (LOS) for existing conditions.

Each traffic signal was inventoried for its cycle length, phasing, and progression characteristics. Geometric conditions of intersections, such as lane group movements, lane widths, and approach grades, were recorded. General operating conditions, such as posted parking regulations, number of parking maneuvers, bus stops, and pedestrian interference, were also observed.

In addition to manual counts, seven days of Automatic Traffic Recorder (ATR) counts were collected at eight locations (Figure 3.4-1, Traffic Count Locations). Intersection turning movement volumes were then adjusted to obtain typical weekday volumes, which were based on daily adjustment factors obtained from ATR counts in accordance with the Mayor's Office of Environmental Coordination's *City Environmental Quality Review – Technical Manual* (1993).

A review of count data indicates low to moderate traffic volumes throughout the study area, which exhibits typical am and pm commuter peak periods. Volumes are consistent throughout the day with a considerable presence of heavy trucks in the traffic stream. Truck percentages in the study area reach 30 percent or less on certain links.

Capacity Analysis

The 1994 HCM provides a methodology to determine capacity and level of service of signalized and unsignalized intersections for each approach, as well as the intersection as a whole. Capacity of an intersection is defined as the maximum rate of flow that may pass through the intersection under prevailing traffic and roadway conditions. The quality of traffic flow through an intersection is described by the intersection's LOS. Level of service for signalized intersections is defined by "average stopped delay" time per vehicle for various movements within the intersection (see Table 3.4-1 for the LOS criteria expressed in terms of average stopped delay). Level of service for a stop-

Traffic Count Locations

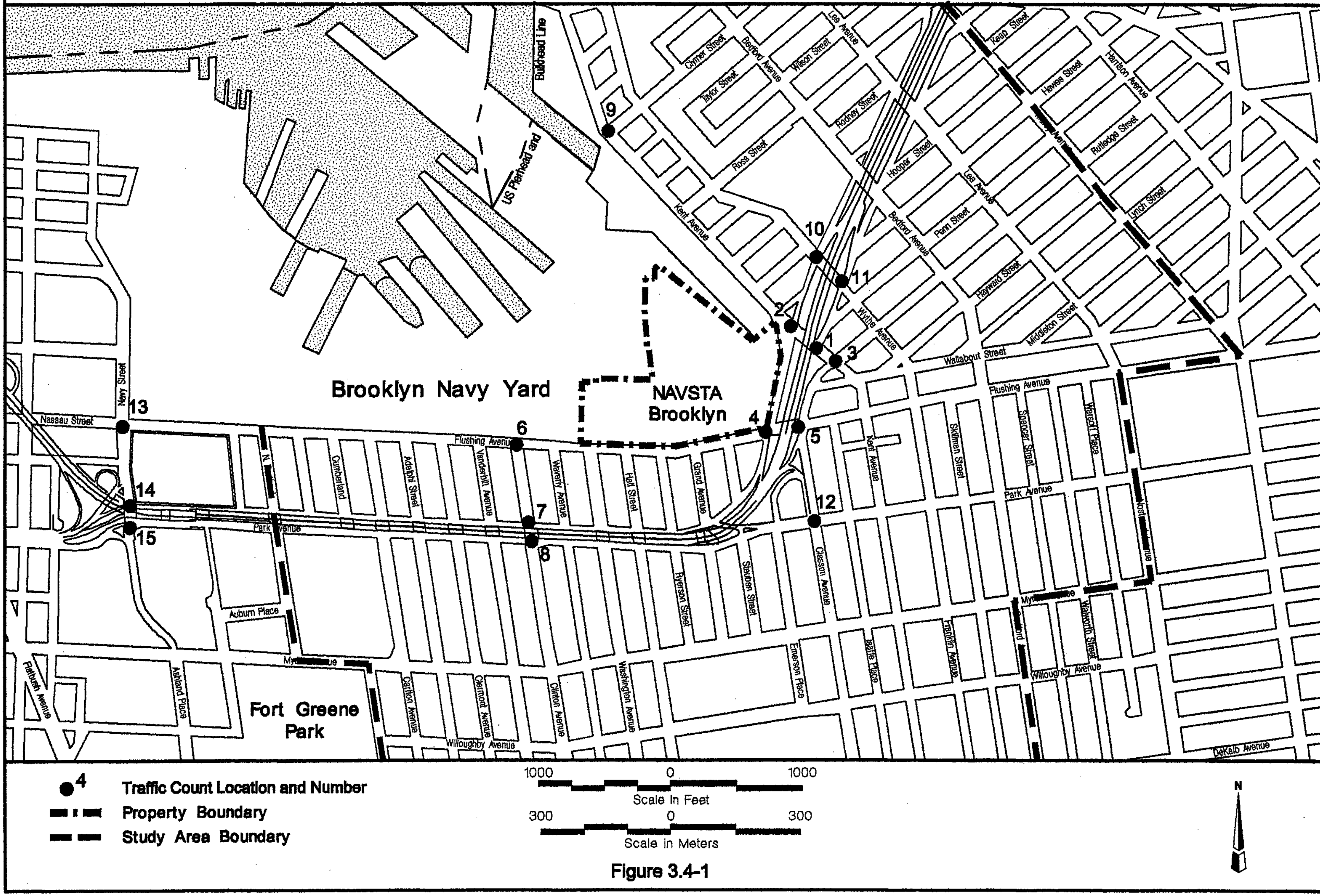


Figure 3.4-1

Table 3.4-1

Traffic Level of Service Definitions for Signalized Intersections

LOS	Description
A	Level A describes operations with very low delay, i.e., less than 5.0 seconds per vehicle. This occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Level B describes operations with delay in the range of 5.1 to 15.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Level C describes operations with delay in the range of 15.1 to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level, although many still pass through the intersection without stopping.
D	Level D describes operations with delay in the range of 25.1 to 40.0 seconds per vehicle. At Level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Level E describes operations with delay in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	Level F describes operations with delay in excess of 60.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.
Source:	Transportation Research Board Special Report 209, Highway Capacity Manual, 1994.

controlled intersection is also based on an average delay per vehicle, which is computed from available gaps in the major roadway traffic stream (see Table 3.4-2 for the LOS criteria for unsignalized intersections).

Capacity analyses were performed at all 15 count locations. Physical inventories showing roadway configuration and existing lane group utilization for each intersection studied are provided in Figure 3.4-2 (Intersection Diagrams: Locations 1-4), Figure 3.4-3 (Intersection Diagrams: Locations 5-8), Figure 3.4-4 (Intersection Diagrams: Locations 9-12), and Figure 3.4-5 (Intersection Diagrams: Locations 13-15). Generally, study area intersections operate acceptably (LOS B or better). Results of lane group LOS for am and pm commuter peaks are presented in Table 3.4-3. More detailed information on results of capacity analyses for existing conditions at the intersections studied are provided in Table D-2, which details intersection approach volumes, V/C ratios, stopped delay, and lane group LOS for am and pm commuter peaks.

For analysis purposes, Williamsburg Street East and Williamsburg Street West were assumed to travel east and west, even though both roads, functioning as service roads, abut the BQE on a section where it is considered to be north/south. For analysis purposes, Flushing Avenue is considered a north/south road with "northbound" approximating actual westbound. These conventions were adopted particularly in dealing with the confusing terminology associated with Williamsburg Street East and Williamsburg Street West (Locations 4 and 5).

Following is a brief description of each intersection and its existing operational characteristics:

- Kent Avenue and Williamsburg Street East (Location 1) – This location is an unsignalized T-intersection. There are no stop signs to control traffic, but Locations 2 and 3 (both signalized) are synchronized to promote proper movement through the intersection (Figure 3.4-1). There is a heavy right-turn volume from Kent Avenue to Williamsburg Street East as vehicles access the northbound BQE; however, this movement is unimpeded, making operation satisfactory. Due to this preponderance of right-turning vehicles, those drivers and drivers making left turns onto Williamsburg Street East perform the movement simultaneously. The available methodologies in the HCM cannot accurately represent this simultaneous operation; however, field observations note satisfactory operation of the left-turn movement.

- Kent Avenue and Williamsburg Street West (Location 2) – Location 2 is a signalized intersection with Williamsburg Street being a one-way, two-lane approach with most vehicles traveling through the intersection. Right-turning movements from Williamsburg Street West use Hewes Street, which acts as a channelized movement for the approach. Kent Avenue turning movements are in the direction of the one-way Williamsburg Street traffic. This intersection operates without any problems in both the am and pm peaks, where every approach, as well as the overall operation, is at LOS B.

Intersection Diagrams: Locations 1-4

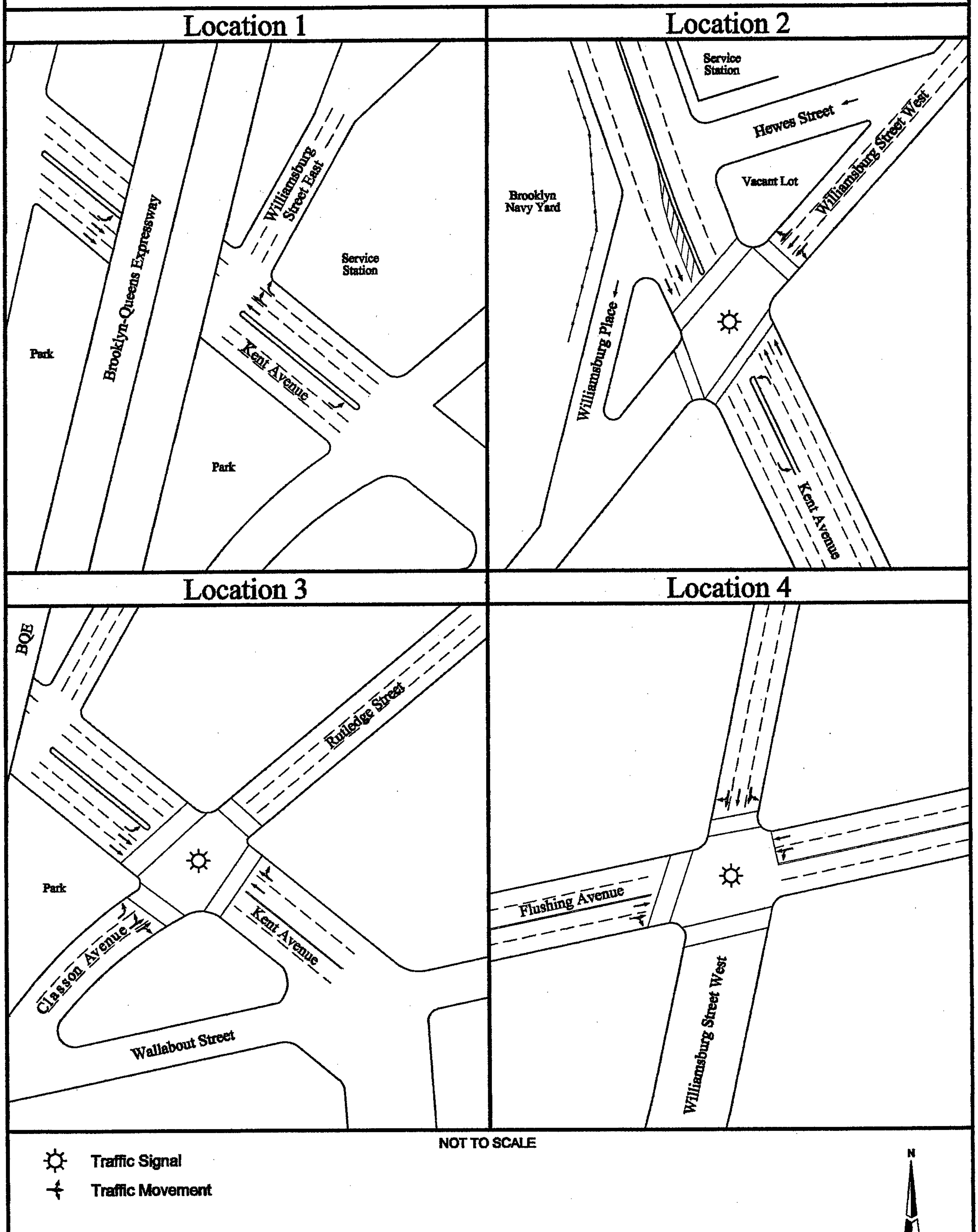
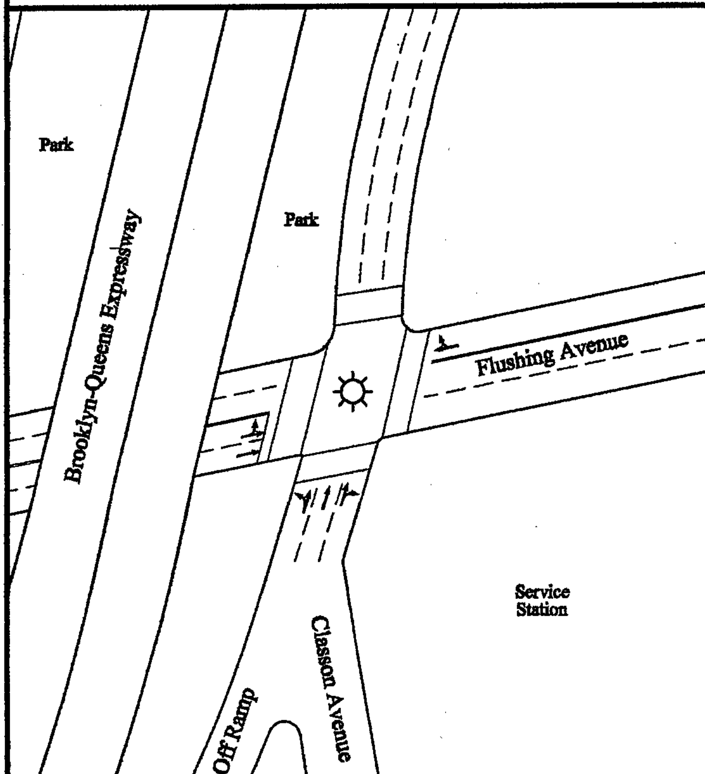


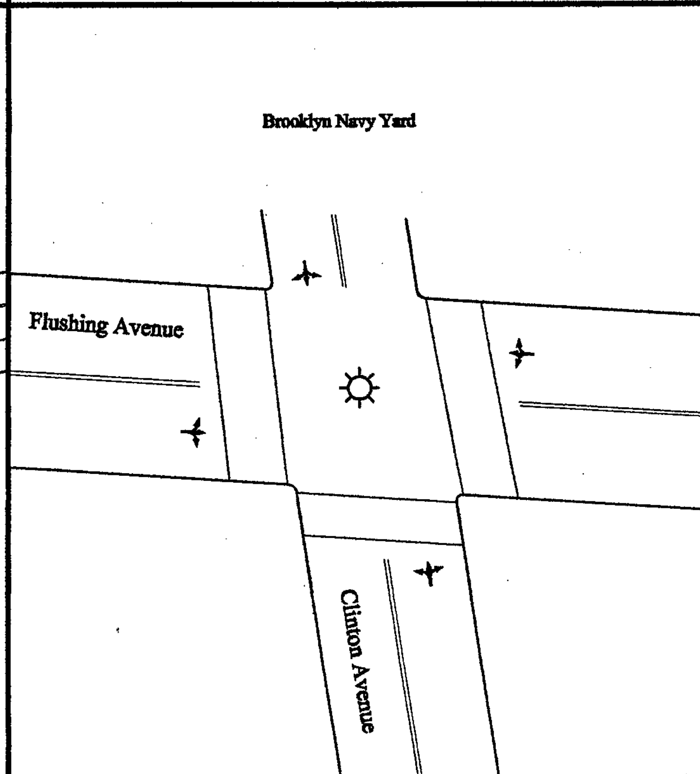
Figure 3.4-2

Intersection Diagrams: Locations 5-8

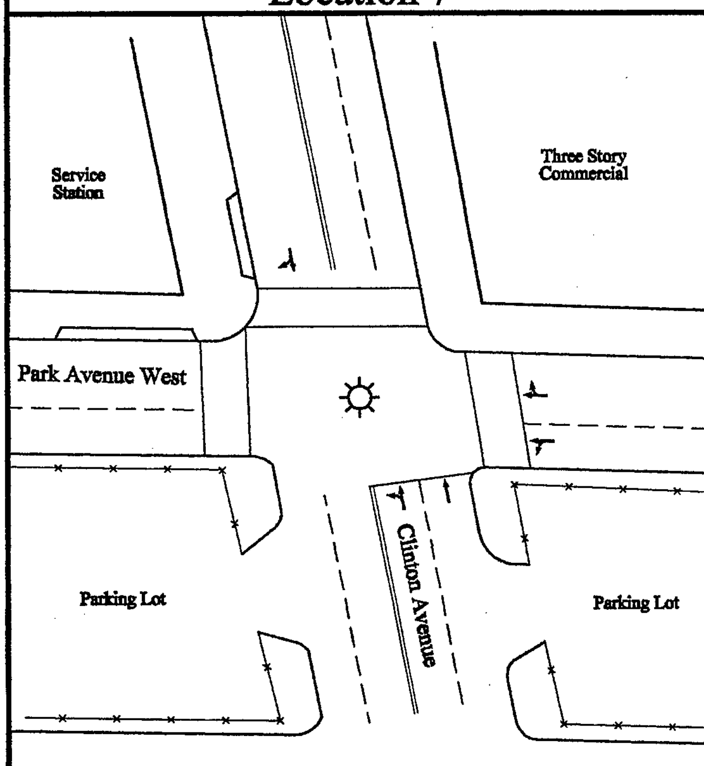
Location 5



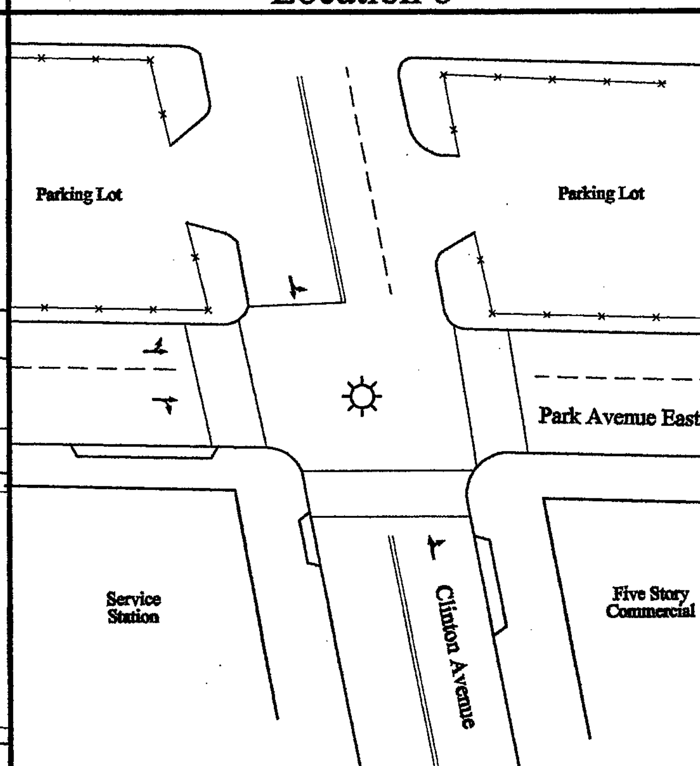
Location 6



Location 7



Location 8



NOT TO SCALE

Traffic Signal

Traffic Movement

N

Figure 3.4-3

Intersection Diagrams: Locations 9-12

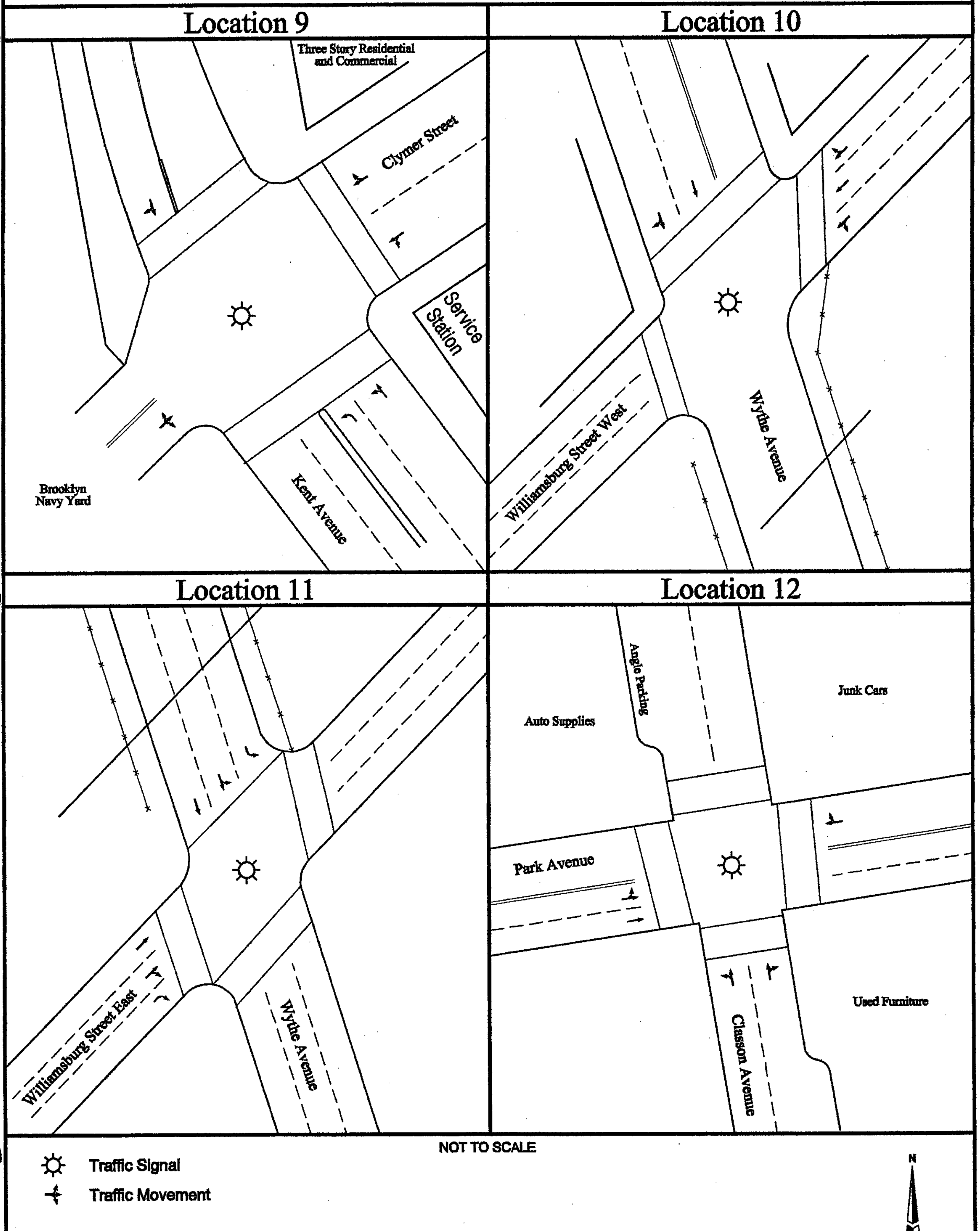


Figure 3.4-4

Intersection Diagrams: Locations 13-15

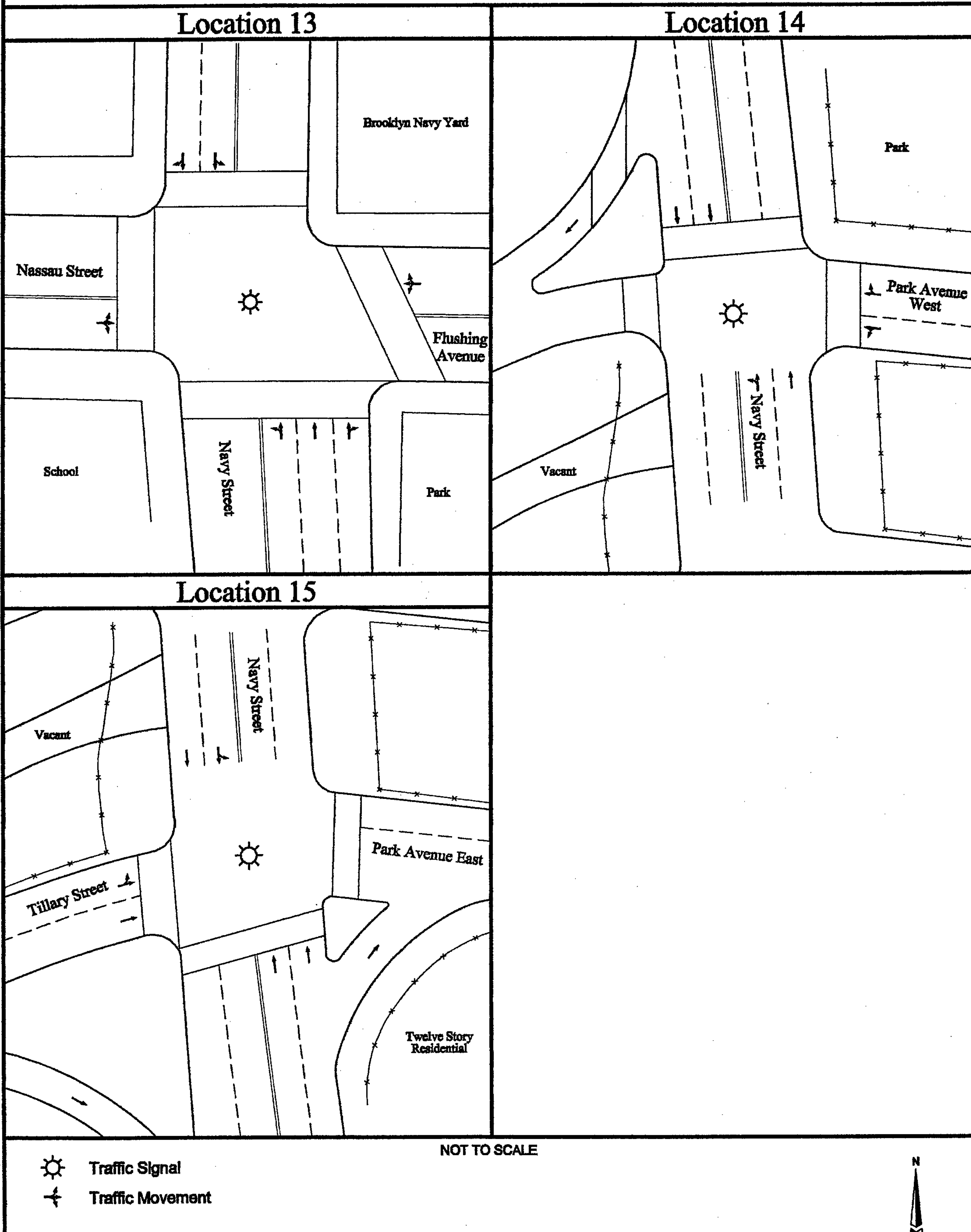


Figure 3.4-5

Table 3.4-2

Level of Service Criteria for Stop-Controlled Intersections

Level of Service	Average Total Delay (SEC/VEH)
A	≤5
B	>5 and≤10
C	>10 and ≤20
D	>20 and≤30
E	>30 and ≤45
F	>45
Source:	Transportation Research Board Special Report 209, Highway Capacity Manual, 1994.

Table 3.4-3

Summary of LOS Analysis, Existing Conditions

Intersection	Existing Conditions	
	AM Peak	PM Peak
Williamsburg Street West and Kent Avenue (Location 2)		
Westbound LTR	B	B
Northbound L	B	B
Northbound T	B	B
Southbound T	B	B
Overall	B	B
Southbound L	B	B
Southbound T	B	B
Overall	B	B
Williamsburg Street West and Flushing Avenue (Location 4)		
Westbound LTR	B	B
Northbound L	B	C
Northbound T	B	B
Southbound TR	B	B
Overall	B	B
Classon Avenue and Flushing Avenue (Location 5)		
Eastbound LTR	B	B
Northbound TR	C	B
Southbound L	C	B
Southbound T	C	B
Overall	B	B
Flushing Avenue and Clinton Avenue (Location 6)		
Eastbound LTR	A	A
Westbound LTR	B	A
Northbound LTR	B	B
Southbound LTR	B	B
Overall	B	B
Park Avenue West and Clinton Avenue (Location 7)		
Westbound LTR	B	B
Northbound L	C	C
Northbound T	C	C
Southbound TR	C	C
Overall	B	B
Park Avenue East and Clinton Avenue (Location 8)		
Eastbound LTR	B	B
Northbound TR	C	C
Southbound LT	C	C
Overall	B	B

Table 3.4-3, Continued

Summary of LOS Analysis, Existing Conditions

Intersection	Existing Conditions	
	AM Peak	PM Peak
Clymer Avenue and Kent Avenue (Location 9)		
Eastbound LTR	C	C
Westbound LTR	C	C
Northbound L	A	A
Northbound LT	A	A
Southbound TR	A	A
Overall	B	B
Williamsburg Street West and Wythe Avenue (Location 10)		
Westbound LTR	B	B
Southbound TR	C	C
Overall	B	B
Williamsburg Street East and Wythe Avenue (Location 11)		
Eastbound TR	B	B
Eastbound R	B	B
Southbound L	B	B
Southbound LT	B	B
Overall	B	B
Park Avenue and Classon Avenue (Location 12)		
Eastbound L	F	F
Eastbound T	B	B
Westbound TR	B	B
Northbound LTR	B	B
Overall	F	F
Flushing Avenue and Navy Street (Location 13)		
Eastbound LTR	B	B
Westbound LTR	B	B
Northbound LTR	C	C
Southbound L	C	F
Southbound TR	C	F
Overall	B	F
Park Avenue West and Navy Street (Location 14)		
Westbound LTR	B	B
Northbound LT	C	C
Southbound T	C	C
Overall	B	B

Table 3.4-3, Continued

Summary of LOS Analysis, Existing Conditions

Intersection	Existing Conditions	
	AM Peak	PM Peak
Park Avenue East and Navy Street (Location 15)		
Eastbound LTR	B	B
Northbound T	C	C
Southbound LT	C	C
Overall	B	B
Notes: For definitions of LOS categories, see Table 3.4-2. L=Left, T=Through, R=Right		

- Kent Avenue and Rutledge Street (Location 3) – This intersection works with Location 2 in allowing a through movement along Williamsburg Street. Eastbound left turn volume (heavy) becomes the right turn movement at Location 2. There is also a small park and recreational facility (basketball, handball) that adds pedestrian volumes to the intersection. Rutledge is a one-way road with three approach lanes, which at times are all used for left turns. Level of service operation in both the am and pm peak is B for every approach as well as the overall level of operation.

- Flushing Avenue and Williamsburg Street West (Location 4) – This location is a four-way signalized approach. Pedestrian volumes are significant, and there are pedestrian crosswalks on every approach. This location operates without any problems in the am peak, where every approach, as well as the overall operation, is at LOS B. In the pm peak, additional southbound volumes cause the northbound left turn movement to operate at LOS C, with overall operation at LOS B.

- Flushing Avenue and Classon Avenue (Location 5) – This location is a two-phase intersection. Again there are pedestrian crosswalks present, with significant activity. Additional northbound am volumes lead to LOS C operation in both the northbound and southbound approaches. In the pm peak, southbound volumes are increased, but the northbound volumes decrease, and this allows LOS B operation at every approach. Both peaks operate at overall LOS B.

- Clinton Avenue and Flushing Avenue (Location 6) – This is a T-intersection, although a fourth approach exists from the Navy Yard industrial park (with a parking area and a small guard station). One-lane approaches exist in the other three directions, with parking allowed on both sides of Flushing Avenue. There is adequate room for right turn bays at the intersection, although there is no striping present. No

approach in either the am or pm peak exhibits delays greater then ten seconds; therefore, LOS B or better is exhibited for every approach. Both peaks operate at overall LOS B.

- Clinton Avenue and Park Avenue West (Location 7) – This is a signalized intersection that works in progression with Location 8. Park Avenue westbound is a one-way, two-lane roadway, while Clinton Avenue has one lane. A parking lot between the two intersections (Locations 7 and 8) at times introduces short queuing lengths between the two intersections. The northbound and southbound movements at this intersection operate at LOS C in both the am and pm peaks, but the westbound movement (which is the major movement for this intersection) operates at LOS B, which results in overall LOS B operation in both peaks.

- Clinton Avenue and Park Avenue East (Location 8) – The second of the two intersections in progression, Location 8 has the same characteristics as Location 7. There is also parking allowed in each direction on both Clinton and Park Avenues. This intersection exhibits the same LOS as Location 7.

- Kent Avenue and Clymer Street (Location 9) – This is a four-way signalized intersection, the eastbound approach of which is an access point to the Navy Yard. Further, Kent Avenue is a divided four-lane roadway, separated by a small (six inch [15 cm]) concrete median. Parking is allowed on both sides of both streets. East and westbound approaches operate at LOS C during both peaks, and the remaining movements operate at LOS A. Thus, overall LOS operation during both peaks is B.

- Wythe Avenue and Williamsburg Street West (Location 10) – This location acts in tandem with Location 11, and has a two-phase signal and significant pedestrian activity. Wythe Avenue is one lane with adequate room for a right-turn bay, and acts as a collector for the Williamsburg district streets allowing access to the BQE. Williamsburg Street (the major movement) maintains LOS B in both peaks, while Wythe Avenue (the minor movement) operates at LOS C. This intersection of two one-way streets operates at an overall LOS B in both peaks.

- Wythe Avenue and Williamsburg Street East (Location 11) – The second half of Location 10, the same conditions exist, with the exception that the southbound approach squeezes three lanes of traffic onto a roadway width better suited for two. Every approach in both the am and pm peaks, as well as the overall intersection, operates at LOS B.

- Park Avenue and Classon Avenue (Location 12) – This location is a signalized intersection, with Classon Avenue being a one-way, two-lane approach and Park Avenue having one lane in each direction. Pedestrian crossings exist in every

approach, and there is visible pedestrian activity. Each approach in both the am and pm peaks operates at LOS B, except the eastbound left-turn that operates at LOS F, causing an overall intersection operation at LOS F during the am and pm peaks.

- Navy Street and Flushing Avenue (Location 13) – This location is a four-way, two-phase signalized intersection. Flushing Avenue is two lanes in each direction, while Navy Street has three lane movements (without striping) in each approach, where there are roadway widths better suited for only two lanes. A school is at the southwest corner of the intersection, and the southeast corner is an entrance to its accompanying recreational grounds. The northeast corner is a border of a housing complex parking area. Significant pedestrian activity exists from both the school and the housing nearby, and there are crosswalks on every approach. Also, bus stops are present on either side of Flushing Avenue, before the signal.

  In the am peak, north and southbound movements operate at LOS C, and the westbound (major movement) and eastbound approaches operate at LOS B. The overall intersection exhibits LOS B in the am peak. In the pm peak, northbound volumes maintain LOS C, and the east and westbound approaches operate at LOS B. Significant southbound traffic, however, introduces LOS F operation for the southbound approach and LOS F for overall operation in the pm peak.

- Navy Street and Park Avenue West (Location 14) – This signalized intersection acts in progression with Location 15. Park Avenue is a two-lane, one-way approach that merges with two separate ramps of traffic. Commodore J. Barry Park borders the northeast corner. Pedestrian movements along Navy Street are significant, with crosswalks on both sides. A parking area is present between Locations 14 and 15. Parking is also allowed on Park Avenue, but only west of the intersection. The north and southbound movements exhibit LOS C operation in both the am and pm peaks. The westbound crossing movement, however, operates at LOS B, and overall operation in the am peak is LOS B. The pm peak operates similarly.

- Navy Street and Park Avenue East (Location 15) – The other half of Location 14, Location 15 has channelized right turn movements, with concrete islands assisting in merging traffic from Park Avenue East onto Navy Street, and from Navy Street onto Park Avenue East. There are housing projects on either side of Navy Street, and pedestrian activity mimics that of location 14. Parking is allowed on Park Avenue East, just east of the intersection. The north and south approaches of Navy Street support two lanes of traffic, and the eastbound approach is one lane that expands to two after the intersection. Due to the short distance along Navy Street between Locations 14 and 15, short queuing lengths from vehicles are possible. This intersection operates at LOS B for both am and pm peaks.

3.4.2 Public Transportation

The closest bus terminal to the site is west of the Navy Yard along Flatbush Avenue. Bus lines running east/west are along Flushing Avenue (B57, 62), Park Avenue (B61), and Myrtle Avenue (B54). North/south routes are along Vanderbilt Avenue (B69) and Classon and Franklin Avenues (B48). The closest subway station is at York Street and Jay Street, which is serviced by the F line.

3.4.3 Parking

On street parking in close proximity to NAVSTA Brooklyn is generally fully occupied during business hours, attributable to the industrial/commercial nature of the area. Difficulties for day-time commuter parking are compounded by the NYC DOS alternate-side-of-the-street cleaning programs.

Off-street parking is provided by many businesses and on some vacant lots. However, very little publicly-accessible parking is available in the vicinity of the site.

3.5 Air Quality

3.5.1 National Ambient Air Quality Standards

The USEPA, under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants, referred to as criteria pollutants (40 CFR 50). These are: ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM), and lead (Pb). The NAAQS include primary and secondary standards. The primary standards (Table 3.5-1) were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. A description of the criteria pollutants and their effects on public health and welfare is presented in Table 3.5-2.

The NYS Department of Environmental Conservation (NYSDEC) has adopted the USEPA's NAAQS as the statewide ambient air quality standards. When the USEPA amended the standard for particulate matter (PM), changing the regulated pollutant from total suspended particulates (TSP) to PM10 that is inhalable, the NYSDEC adopted the PM10 standard but continued to use both PM10 and TSP as monitoring indicators for the level of particulate matter. Therefore, the New York ambient air quality standards include all of the NAAQS, plus a standard for TSP.

The CAA requires that the USEPA review scientific data every five years to ensure that the NAAQS effectively protect the public health. As a result of one such review, on September 16, 1997 the USEPA enacted a more stringent standard for ozone (O_3). The final standard has been updated from 0.12 parts per million (ppm) of ozone measured over one hour to a standard of 0.08 ppm measured over eight hours, with the average fourth-highest concentration over a three-year period determining whether an area is in compliance.

Following the promulgation of this revised NAAQS, the CAA provides up to three years for state governors to recommend and the USEPA to designate areas for attainment or non-attainment of the standard according to their most recent air quality data. In addition, states will have up to three years from designation to develop and submit State Implementation Plans (SIPs) for attaining the new standard.

Additionally, a new standard for particulate matter was issued on July 18, 1997 by the USEPA. The standard for PM10 remains essentially unchanged, while a new standard for fine particles (PM2.5: diameter $\leq$ 2.5 micrometers) is set at an annual limit of 15 micrograms per cubic meter ($\mu g/m^3$), with a 24-hour limit of 65 $\mu g/m^3$. Because this new standard would regulate fine particulates for the first time, the USEPA will allow five years to build a nationwide monitoring network and to collect and analyze the data needed to designate areas and develop implementation plans. Therefore, this standard cannot yet be implemented.

Table 3.5-1

National and New York Ambient Air Quality Standards

Pollutant and Averaging Time	Primary Standard[1]	Secondary[1]
Ozone (O_3) 1-hour Maximum 8-hour Maximum	0.12 ppm[3] 0.08 ppm[4]	Same as primary standard
Carbon Monoxide (CO) 1-hour Maximum 8-hour Maximum	40,000[2] 10,000[2]	Same as primary Standard
Sulfur Dioxide (SO_2) Annual Arithmetic Mean 24-hour Maximum 3-hour Maximum	80 365[2] -	1300[2]
Nitrogen Dioxide (NO_2) Annual Arithmetic Mean	100	Same as primary standard
Particulate Matter (PM) PM10: Annual Arithmetic Mean 24-hour Maximum PM2.5: Annual Arithmetic Mean 24-hour Maximum TSP Annual Arithmetic Mean 24-Hour Maximum	 50[7] 150[5] 15[7] 65[6] 75 250	Same as primary standard
Lead (Pb) Quarterly Arithmetic Mean	1.5[8]	Same as primary standard

Notes: [1] All concentrations are in micrograms per cubic meter of air unless designated as parts per million (ppm).
[2] Not to be exceeded more than once a year.
[3] Expected number of exceedance days of 3-year average shall not be more than once per year.
[4] An area will attain the standard when 3-year average of the annual 4th-highest daily maximum 8-hour concentrations is below 0.08 ppm.
[5] An area will attain the standard when the annual highest 99th percentile of 24-hour concentrations over 3 years is below 150 $\mu g/m^3$.
[6] An area will attain the standard when the annual highest 98th percentile of 24-hour concentrations over 3 years is below 65 $\mu g/m^3$.
[7] An area will attain the standards when the 3-year annual averages are below 50 µg/m3 for PM10 and below 15 µg/m3 for PM2.5.
[8] Not to be exceeded in any quarter.

Sources: 40 CFR 50; USEPA Fact Sheets, June 1997; 1996 Annual New York State Air Quality Report, June 1997.

Table 3.5-2

Criteria Pollutants - Their Sources and Effects

Pollutants and Their Sources	Health and Welfare Effects
Ozone (O_3): O_3 is not emitted directly into the atmosphere. It is formed in the atmosphere by a series of complex chemical reactions involving primarily nitrogen dioxides and volatile organic compounds in the presence of heat and sunlight. These reactions are time-dependent and usually take place far downwind from the site where the ozone precursors were originally emitted. These precursors are typically emitted from motor vehicle exhaust and industrial processes using solvents.	**Health:** O_3 is a highly reactive gas which irritates the mucous membranes and other lung tissues, causing respiratory impairment. O_3 has been found to affect not only those with respiratory problems, such as asthma, but also healthy adults and children. Effects include breathing difficulty when exercising and reduced resistance to respiratory infections. Acute exposures cause bronchial constriction, lung edema, and abnormal lung development. **Welfare:** Toxic to plants, causing leaf damage and decrease in growth. Weakens materials such as rubber and fabrics.
Carbon Monoxide (CO): The major source of CO is the incomplete combustion of fuels used to power vehicles, etc. Motor vehicles are the principal source of urban CO emissions. CO is a site-specific pollutant. High levels of CO are found near the source, such as at heavily-congested intersections. Other sources include power plants, industrial processes, and space heating.	**Health:** CO enters the bloodstream by combining with hemoglobin, which reduces the amount of oxygen carried to organs and tissue. The health threat is most severe for those with cardiovascular disease. Healthy individuals are affected at higher concentrations (>30 ppm). Symptoms include shortness of breath, chest pain, headaches, confusion, and loss of coordination. **Welfare:** No known effect on materials or vegetation.
Sulfur Dioxide (SO_2): SO_2 results largely from the combustion of sulfur-bearing fuels such as coal and oil combustion in heat and power generation facilities. Other sources include pulp and paper mills, refineries, and non-ferrous smelters. The combustion of gasoline and diesel fuels in motor vehicles accounts for a very small percentage of the total sulfur dioxides emitted.	**Health:** SO_2 combines with water vapor to form acidic aerosols which irritate the respiratory tract. It aggravates symptoms associated with chronic lung diseases such as asthma and bronchitis. **Welfare:** SO_2 is a primary contributor to acid deposition, which causes acidification of lakes and streams. Acid deposition also damages materials (corrodes metals, degrades rubber and fabrics), injures vegetation, and causes visibility degradation.
Nitrogen Dioxide (NO_2): NO_2 is formed in the atmosphere from the oxidation of nitric oxide (NO). The major sources of NO is fuel combustion in boilers and engines associated with power plants, motor vehicles, industrial furnaces and space heating.	**Health:** NO_2 can cause irritation to the lungs, lower resistance to respiratory infections, and aggravate symptoms associated with asthma and bronchitis. **Welfare:** NO_2 decreases visibility by causing a reddish-brown haze. It is a contributor to acid deposition, which causes acidification of lakes and streams, as well as plant injury and damage to materials (metals, rubber, fabric).
Particulate Matter (PM10): PM are tiny airborne particles or aerosols which include dust, dirt, smoke, and liquid droplets and occur as a result of incomplete fuel combustion. PM10 encompasses PM with an aerodynamic diameter of 10 microns or less. Sources include factories, power plants, motor vehicles, construction activities, and fires. Diesel fuel contributes more particulates to the atmosphere than does gasoline.	**Health**: PM10 particles, because of their small size, are able to be inhaled and reach the thoracic region of the respiratory system. The health effects are often not immediately noticed. The particulates can accumulate in the lungs after long-term exposure and affect breathing and respiratory symptoms. The lung's natural cleansing and defense mechanisms are impaired. **Welfare:** Causes soiling and corrosion to materials. Decreases visibility by forming atmospheric haze.
Lead (Pb): The primary source for airborne Pb used to be motor vehicles, but the use of unleaded gas has dramatically reduced Pb emissions.	**Health**: Causes mental retardation and brain damage, especially to children. Causes liver disease; may be a factor in high blood pressure. Also damages the nervous system. **Welfare**: No direct impact on vegetation.

On May 14, 1999, the US Court of Appeals for the District of Columbia issued an opinion regarding the two new NAAQS for O_3 and PM. The Court's decision left the new eight-hour O_3 standard in place, but stated that it "cannot be enforced" and left open the issue of whether the fine particle (PM2.5) standards should remain in place. The Court's opinion is still being reviewed by the USEPA and the Department of Justice (DoJ). The USEPA has asked the DoJ to appeal this decision and take all judicial steps necessary to overturn the Court's decision.

National Ambient Air Quality Standard Attainment Status

Areas that meet the NAAQS standard for a criteria pollutant are designated as being in "attainment;" areas where the criteria pollutant level exceeds the NAAQS are designated as being in "nonattainment." Nonattainment areas are subcategorized based on the severity of their pollution problem (marginal, moderate, serious, severe, or extreme). When insufficient data exist to determine an area's attainment status, it is designated unclassifiable (or attainment). NAVSTA Brooklyn is located in an area currently designated as follows:

- Moderate nonattainment for carbon monoxide (CO);
- Severe nonattainment for O_3; and
- Attainment for the other criteria pollutants.

State Implementation Plans

The CAA, as amended in 1990 (CAAA), mandates that state agencies adopt SIPs that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth plans to achieve and maintain NAAQS attainment. New York State has developed SIPs addressing its O_3 and CO nonattainment problems.

New York State's SIP to achieve O_3 attainment is presented in *New York State Implementation Plan for Ozone, Phase I Alternative Attainment Demonstration - Meeting the 1996 15% and 1999 9% Rate of Progress Requirements for the New York and Lower Orange County Metropolitan Areas* (NYSDEC, March 1997). This SIP sets forth how emissions that contribute to the formation of O_3 were to have been reduced by 15 percent from 1990 to 1996, and then by nine percent (three percent per year) from 1996 to 1999. If these goals are achieved, emissions would be reduced by a total of 24 percent over the 1990 base year emission inventory. There has been a significant reduction over the past few years in ground level O_3 concentrations in the state's severe nonattainment area (NYSDEC, July 1996).

New York State's SIP to achieve CO attainment is set forth in *New York State Implementation Plan, Carbon Monoxide Attainment Demonstration, New York Metropolitan Area* (NYSDEC, December 1993). Proposed emission control measures to reduce future CO levels include the use of oxygenated fuels during the winter months, as well as transportation control measures throughout the New York metropolitan area. The project is located in an area designated as moderate nonattainment for CO;

however, only one exceedance of the eight-hour standard has been recorded in the New York metropolitan area since 1992. This exceedance was measured in February of 1995 at the Brooklyn Transit traffic site (a site selected by NYSDEC as representative for CO monitoring) (NYSDEC, 1996). In general, short-term CO levels (one-hour and eight-hour) have declined over the past five years, especially in those areas with high traffic density such as the New York metropolitan area, mainly due to the implementation of mobile source emission control measures.

Background Air Quality Data

Air quality data for New York State is collected by the NYSDEC Division of Air Resources using USEPA-certified equipment and procedures at sites meeting the USEPA siting criteria. In general, monitoring sites for this study were selected because they represent locations of high population density and/or because, due to source population or strength and meteorology, high concentrations of pollutants would be expected. The most recent ambient monitoring data (1997) collected at the monitoring sites that are considered representative of background levels for the project area are summarized in Table 3.5-3. All of the ambient pollutant levels were below the corresponding NAAQS, except for O_3; however, this level is expected, as the project is located in a severe O_3 nonattainment area.

3.5.2 Mobile Sources

An analysis of CO concentrations was performed for intersections located near the project site. Although vehicles primarily emit CO, VOCs, and NO_x, only CO emissions were analyzed because CO is a site-specific pollutant with major concentrations generally found immediately adjacent to roadways, and specifically at heavily congested intersections. VOCs and NO_x are not site-specific pollutants and are considered only on a regional basis. Lead emissions from automobiles are insignificant as a result of the decreased use of leaded gasoline. Particulate matter and sulfur dioxide emissions from vehicles are also insignificant when compared to emissions from non-mobile sources.

The CO air quality analysis is based on procedures outlined in the following documents:

- *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (USEPA, November 1992);
- *Mobile5b User's Guide* (USEPA, April 1997);
- *City Environmental Quality Review Technical Manual* (NYC Department of Environmental Protection [NYCDEP], December 1993); and
- *Technical Memorandum* (NYCDEP, March 10, 1998).

Table 3.5-3

1996 Background Ambient Air Quality Data

Pollutant/ Averaging Time	Measured Concentration (μg/m3)	Monitoring Site
Ozone (O_3)		Botanical Gardens, Bronx
1-hour Maximum (ppm)	0.128	
Second Highest 1-hour (ppm)	0.123	
Carbon Monoxide (CO)		PS 321, Brooklyn
Second Highest 8-hour (ppm)	2.7	
Second Highest 1-hour (ppm)	3.7	
Sulfur Dioxide (SO_2)		301 Greenpoint Avenue, Brooklyn
Annual Arithmetic Mean	29	
Second Highest 24-hour	134	
Second Highest 3-hour	231	
Nitrogen Dioxide (NO_2)		301 Greenpoint Avenue, Brooklyn
Annual Arithmetic Mean	65	
Particulate Matter (TSP)		301 Greenpoint Avenue, Brooklyn
Annual Geometric Mean	58	
Second Highest 24-hour	98	
Particulate Matter (PM10)		301 Greenpoint Avenue, Brooklyn
Annual Arithmetic Mean	26	
Second Highest 24-hour	64	
Lead (Pb)		301 Greenpoint Avenue, Brooklyn
Quarterly Arithmetic Mean Maximum	0.16	

Notes: All concentrations are in micrograms per cubic meter ($\mu g/m^3$) of air, except for CO and O_3, which are expressed in parts per million (ppm).

Source: *1997 Annual New York State Air Quality Report* (NYSDEC, 1998)
Data provided by NYCDEP (NYCDEP, October 2, 1998)

Mathematical Models Used

The concentrations of CO due to local roadway traffic are determined through two steps: 1) vehicle exhaust emission factors are calculated using the USEPA Mobile5b computer model; and 2) these emission factors are subsequently used as input for the USEPA CAL3QHC dispersion model to calculate CO concentrations. The models used are described as follows:

- Mobile5b generates vehicular emission factors based on locality-specific vehicle fleet characteristics including vehicle age, operating mode of vehicles (hot/cold starts), and percentage of oxygenated fuel used. Additionally, Mobile5b can incorporate adopted emission control strategies such as anti-tampering programs and inspection and maintenance (I/M) programs including stringency, compliance rate, waiver rate, and vehicle years covered. Appropriate, area-specific input parameters provided by NYSDEC and NYCDEP were used.

- CAL3QHC (Version 2) predicts the one-hour level of CO or other pollutant concentrations from motor vehicles traveling near roadway intersections. The model incorporates input such as roadway geometry, traffic volumes, vehicular emission rates, and meteorological conditions (worst-case meteorological assumptions were used in the analysis).

A conservative USEPA-provided default persistence factor of 0.7 was used to convert the one-hour CO concentrations calculated by CAL3QHC to eight-hour concentrations. In other words, the model-calculated one-hour CO concentrations were multiplied by 0.7 to derive eight-hour concentrations. The persistence factor represents a combination of the variability in both traffic and meteorological conditions.

CO Impact Assessment

The worst-case CO impacts were estimated for receptor locations at seven intersections (Figure 3.5-1, Air Modeling Receptor Locations) that were selected for modeling based upon the detailed traffic analysis described in Subchapter 3.4. Based on the Highway Capacity Manual (HCM) analysis performed for approximately 14 intersections in the project neighborhood, these seven signalized intersections are those that are expected to experience the maximum changes in future traffic patterns due to the project or that would operate with the overall worst-case traffic conditions. The receptors were placed at reasonable locations, such as sidewalks along roadway edges.

The CO levels due to traffic on local streets were calculated using the computer models described above. However, total ambient CO concentrations near roadways consist of two components: local source contributions (i.e., vehicular emissions near roadways) and the background contribution from other sources, such as stationary sources, in the project area. Thus, a background concentration was determined and added to the modeled concentrations for comparison to the NAAQS. Since no

recorded background CO data are available at these modeled intersections (the CO data provided in Table 3.5-4 include levels from both local and other sources), a one-hour CO background level of 3.90 ppm (NYSDOT, April 1998) and an eight-hour level of 2.7 ppm (NYCDEP, March 10, 1998), were used. These values are the background CO levels recommended by the agencies for CO impact analysis at intersections.

The results of the CO analysis are presented in Table 3.5-4. The highest calculated levels occur during the pm peak, as the traffic conditions are such that the greatest emissions occur at that time. The modeling results indicate no existing violations of the one-hour CO standard of 35 ppm and the eight-hour CO standard of nine ppm at the modeled intersections.

3.5.3 Stationary Sources

There are no major stationary sources currently located on the project site. Two major off-site sources are situated near the project site:

- A Con Edison (Con Ed) power plant is located at 1-11 Hudson Avenue, Brooklyn, approximately 4,260 ft (1,300 m) northwest of the project site. Con Ed has four boilers and three gas turbines; and

- The Brooklyn Navy Yard Cogen Plant (BNYCP) is located at Cumberland Street, Brooklyn, approximately 3,100 ft (950 m) from the project site. BNYCP has two low NO_x gas turbines.

These plants are currently operated under air permits issued by the NYSDEC.

3.5.4 Clean Air Act Conformity

In Section 176(c) of the CAAA, the term "conformity" is defined as "conformity to the State Implementation Program's (SIP) purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards." Conformity further requires that such activities will not:

(1) Cause or contribute to any new violations of any standards;
(2) Increase the frequency or severity of any existing violation of any standards; or
(3) Delay timely attainment of any standard or any required interim emission reductions or other milestones.

Air Modeling Receptor Locations

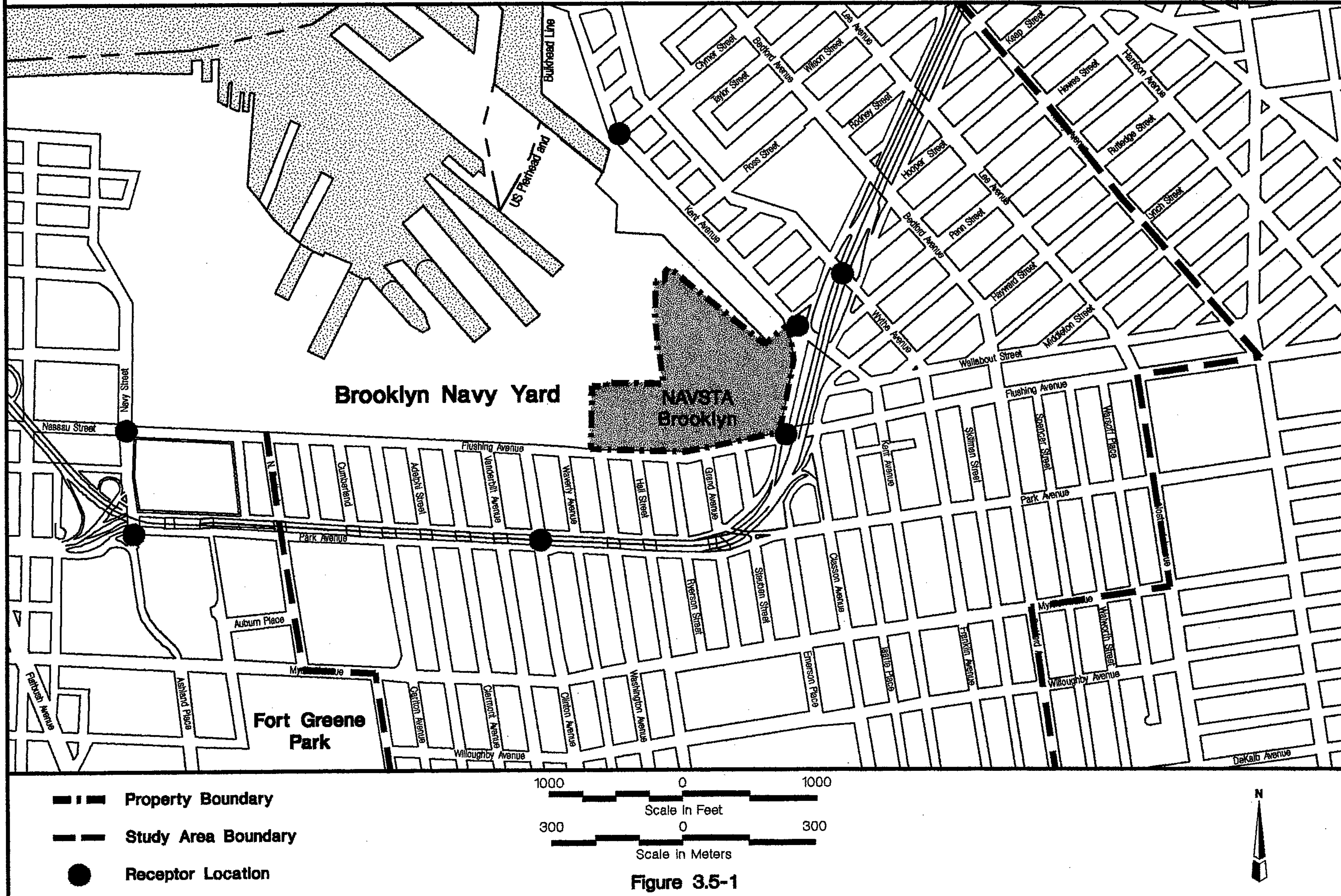


Figure 3.5-1

Table 3.5-4

Existing Carbon Monoxide Levels

Receptor	One-Hour Concentration (ppm)	Eight-Hour Concentration (ppm)
Park Avenue East /Park Avenue West and Clinton Avenue	6.1	4.2
Kent Avenue and Clymer Street	5.2	3.6
Kent Avenue and Williamsburg Street West	6.3	4.4
Williamsburg Street East/Williamsburg Street West and Wythe Avenue	6.6	4.6
Williamsburg Street West and Flushing Avenue	6.6	4.6
Flushing Avenue and Navy Street	6.8	4.7
Park Avenue East/Park Avenue West and Navy Street	6.9	4.8
Note: 1) CO levels include background concentrations of 3.9 ppm (one-hour) and 2.7 ppm (eight-hour). 2) Values are for the peak pm period.		

The USEPA final rule on general conformity applies to federal actions in areas designated nonattainment for any of the criteria pollutants under the CAA (40 CFR Part 51 Subpart W). The rule provides specific *de minimis* emission levels by pollutant to determine the applicability of conformity requirements for a proposed project. For a severe O_3 and marginal CO nonattainment area such as the one around NAVSTA, 25 tons per year (tpy) (23 metric tpy) of VOCs or NO_x and 100 tpy (91 metric tpy) of CO are the *de minimis* criteria. However, the final rule also defines a series of exemptions under 40 CFR 93.153 (Applicability). In particular, the general conformity rules are not applicable to this project under Exemptions XIV and XIX, which respectively read:

> *"Transfers of ownership, interests, and titles in land, facilities, and real and personal properties, regardless of the form and method of the transfer."*

> *"Actions (or portions thereof) associated with transfers of land, facilities, title, and real properties through an enforceable contract or lease agreement where the delivery of the deed is required to occur promptly after a specific, reasonable condition is met, such as promptly after the land is certified as meeting the requirements of CERCLA, and where the federal agency does not retain continuing authority to control emissions associated with the lands, facilities, title, or real properties."*

3.6 Noise

3.6.1 Noise Fundamentals and Methodology

Noise pollution comes from numerous sources. Some noise is caused by activities essential to the health, safety, and welfare of the community's inhabitants, such as emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources of noise, such as traffic and aircraft, stem from the movement of people and goods, activities that are essential to the viability of a community as a place to live and do business. Although these and other noise-producing activities are necessary to modern life, the noise they produce is sometimes undesirable and may detract from the quality of the living environment.

Ways to Measure Noise

A number of factors affect sound as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels (dB). Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to compensate for the human lack of sensitivity to low-pitched and high-pitched sounds. This adjusted unit is known as the A-weighted decibel, or dBA. The A-weighted network de-emphasizes both very low- and very high-pitched sounds, so the measured levels correlate well with the human perception of loudness.

Human response to changes in noise levels depends on a number of factors, including the quality of the sound, the magnitude of the changes, the time of day at which the changes take place, whether the noise is continuous or intermittent, and the individual's ability to perceive the changes. Human ability to perceive changes in noise levels varies widely with the individual, as does response to the perceived changes. Generally, changes in noise levels less than three dBA will barely be perceptible to most listeners, whereas a ten dBA change normally is perceived as a doubling (or halving) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

Since the dBA noise metric describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over extended periods are needed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period, as if it had been a steady, unchanging sound. For this condition, a descriptor called the equivalent sound level, L_{eq}, can be computed. The L_{eq} descriptor is the constant sound level that, in a given situation and time period (e.g., one-hour L_{eq}, or 24-hour L_{eq}), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x are also sometimes used to indicate noise levels which are exceeded 1, 10, 50, 90, and x percent of the time, respectively.

Alternatively, it is often useful to account for the difference in response of people in residential areas to noises that occur during sleeping hours as compared to waking hours. A widely-used indicator for such evaluations is the day-night noise level (L_{dn}) descriptor, defined as the A-weighted average sound level in decibels during a 24-hour period with a ten dB weighting applied to nighttime sound levels. The ten dB weighting accounts for the fact that noises at night sound louder because there are usually fewer noises occurring at night. The L_{dn} descriptor has been proposed by the US Department of Housing and Urban Development (USHUD), the USEPA, and other organizations as one of the most appropriate criteria for estimating the degree of nuisance or annoyance that increased noise levels would cause in residential neighborhoods.

The maximum one-hour equivalent sound level (one-hour L_{eq}), the 24-hour equivalent sound level (24-hour L_{eq}), the L_{dn}, and the L_{10} have been selected as the noise descriptors to be used in the noise impact analysis of this project. Maximum one-hour equivalent sound levels were used to provide an indication of highest expected sound levels.

3.6.2 Noise Standards and Criteria

There are a number of standards and guidelines adopted by federal and local agencies for assessing noise impacts that are used in this EIS. These regulations and standards are useful to review in that they provide both a characterization of the quality of the existing noise environment as well as a measure of project-induced impacts.

Federal Highway Administration (23 CFR 772)

The Federal Highway Administration (FHWA) noise regulations require that a noise analysis be conducted for all highway projects (FHWA, 1995). These standards contain noise abatement criteria that the FHWA considers to be the acceptable limits for noise levels for exterior land uses and outdoor activities and for certain interior uses (Table 3.6-1). The FHWA noise abatement criteria lists developed land use types as Categories A, B, C, or E (undeveloped land is listed as Category D). In this EIS, Category B, which includes residences, schools and churches, would represent most of the sensitive receptors that are in proximity to the proposed project. Future noise levels are predicted to evaluate the extent of impacts in relation to the noise abatement criteria. If these criteria are exceeded, or if there is a substantial increase above the existing noise level, abatement or mitigation measures are considered. Such measures are to be implemented for all project alternatives.

Table 3.6-1

FHWA Noise Abatement Criteria

Activity Category	L_{eq}(h)	L_{10}(h)	Description of Activity Category
A	57 (exterior)	60 (exterior)	Land for which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	70 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	75 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	–	–	Undeveloped lands.
E	52 (interior)	55 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Note: The L_{eq} and L_{10} designations represent hourly A-weighted sound levels expressed in decibels (dBA). Either L_{10}(h) or L_{eq}(h) (but not both) may be used on a project.

Source: US Department of Transportation, FHWA, 1995.

Table 3.6-2

HUD Site Acceptability Standards

Noise Zone	Day/Night Sound Level (L_{dn})
Acceptable	Not exceeding 65 dB
Normally Unacceptable	Above 65 dB but not exceeding 75 dB
Unacceptable	Above 75 dB

Source: 24 CFR Part 51.

USHUD Environmental Criteria and Standards

USHUD has adopted environmental standards, criteria, and guidelines for determining the acceptability of federally assisted projects and has proposed mitigation measures to ensure that activities assisted by USHUD will achieve the goal of a suitable living environment. These guideline values are strictly advisory.

USHUD assistance for the construction of new noise-sensitive land uses is generally prohibited for projects with Unacceptable (as defined in Table 3.6-2) noise exposure and is discouraged for projects with Normally Unacceptable noise exposure with suitable mitigating measures. This policy applies to all USHUD programs for residential housing, college housing, mobile home parks, nursing homes, and hospitals. It also applies to USHUD projects for land development, new communities, redevelopment, or any other provision of facilities and services that is directed toward making land available for housing or noise-sensitive development.

Sites falling within the Normally Unacceptable zone require implementation of additional sound attenuation or reduction or other mitigation measures: five dB if the L_{dn} is greater than 65 dB but does not exceed 70 dB and ten dB if the L_{dn} is greater than 70 dB but does not exceed 75 dB. If the L_{dn} exceeds 75 dB, the site is considered Unacceptable for residential use.

USHUD encourages noise attenuation features in new construction or in alterations of existing structures to eliminate or minimize Unacceptable or Normally Unacceptable levels. These measures include well-sealed double-glazed windows, forced-air ventilation systems (which permit windows to remain closed in summer), and acoustic shielding and insulation.

New York City CEPO-CEQR Noise Exposure Standards and Significant Criteria

The NYCDEP has adopted a policy that sets standards on noise exposure and designates mitigation measures according to City Environmental Protection Order (CEPO) and City Environmental Quality Review (CEQR) requirements. The key noise metric used is the L_{10} descriptor in the form of noise acceptability levels that have been developed for various land use conditions. These CEPO-CEQR standards, presented in Table 3.6-3, are used for evaluating the noise impact of projects on the environment.

In addition to L_{10} noise standards, the NYCDEP has also provided guidelines and recommendations for the determination of impact significance (CEQR, December 1993):

- "For significant impact during daytime hours, 65 dBA L_{eq} (1) may be considered as an absolute noise level that should not be significantly exceeded."

Table 3.6-3

CEPO-CEQR Noise Exposure Guidelines

Receptor Type	Time Period	Acceptable General External Exposure	Marginally Acceptable General External Exposure	Marginally Unacceptable General External Exposure	Clearly Unacceptable General External Exposure
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA			
Hospital or nursing home		$L_{10} \leq 55$ dBA	$55 < L_{10} \leq 65$ dBA	$65 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA
Residence, residential hotel or motel	7 am - 11 pm	$L_{10} \leq 55$ dBA	$65 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA
	11 pm - 7 am	$L_{10} \leq 55$ dBA	$55 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 am - 11 pm)	Same as Residential Day (7 am - 11 pm)	Same as Residential Day (7 am - 11 pm)	Same as Residential Day (7 am - 11 pm)
Commercial or office		Same as Residential Day (7 am - 11 pm)	Same as Residential Day (7 am - 11 pm)	Same as Residential Day (7 am - 11 pm)	Same as Residential Day (7 am - 11 pm)
Industrial, public areas only[3]	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3

Source: NYCDEP (adopted by DEP for use in CEQR-1983).

Notes: [1]Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by the American National Standards Institute (ANSI); all values are for the worst hour in the time period.

[2]Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or open spaces dedicated to or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.

[3]External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the NYC Zoning Resolution, Sections 42-20 and 42-21. The references standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

- "If the no action levels are less than 60 dBA L_{eq} (1) and the analysis period is not a nighttime, the threshold for a significant impact would be an increase of at least 5 dBA L_{eq} (1). In order for 5 dBA threshold to be valid, the resultant action condition noise level would have to be equal to or less than 65 dBA. If the no action noise level would be 62 dBA L_{eq} (1) or more, 3 dBA L_{eq} (1) or greater change should be considered significant."
- "For significant impact during nighttime hours, a change of 3 dBA L_{eq} (1) would typically be considered significant."

3.6.3 Noise Monitoring

A noise measurement survey was conducted in the study area to characterize the existing noise environment. Locations were selected based on potential noise sensitivity due to land use and proximity to the project site. Receptor locations selected included ones situated immediately adjacent to streets where there would be increases in traffic from implementation of the proposed action.

Ten monitoring locations were identified (Figure 3.6-1, Noise Monitoring Locations). The measurement programs were conducted for four time periods (am peak, midday, pm peak, and pre-midnight) for several days in December 1998. The noise monitoring sites are identified below:

Site 1: 36A Wythe Avenue, a residential house located on midblock between Ross Street and Rodney Street.

Site 2: Midblock on Kent Avenue between Rodney Street and Keap Street, opposite the Brooklyn Navy Yard.

Site 3: Midblock on the south side of Clymer Street between Wythe Avenue and Kent Avenue. This site is in front of a block of residential homes, and has a direct line of sight to the traffic on Kent Avenue.

Site 4: Midblock on Kent Avenue between Wallabout Street and Rutledge Street. This site is on the east side of the BQE and in front of a block of three-story residential buildings.

Site 5: 66 Williamsburg Street between Wythe Avenue and Bedford Avenue. This site is on the east side of the BQE near the northbound entrance.

Noise Monitoring Locations

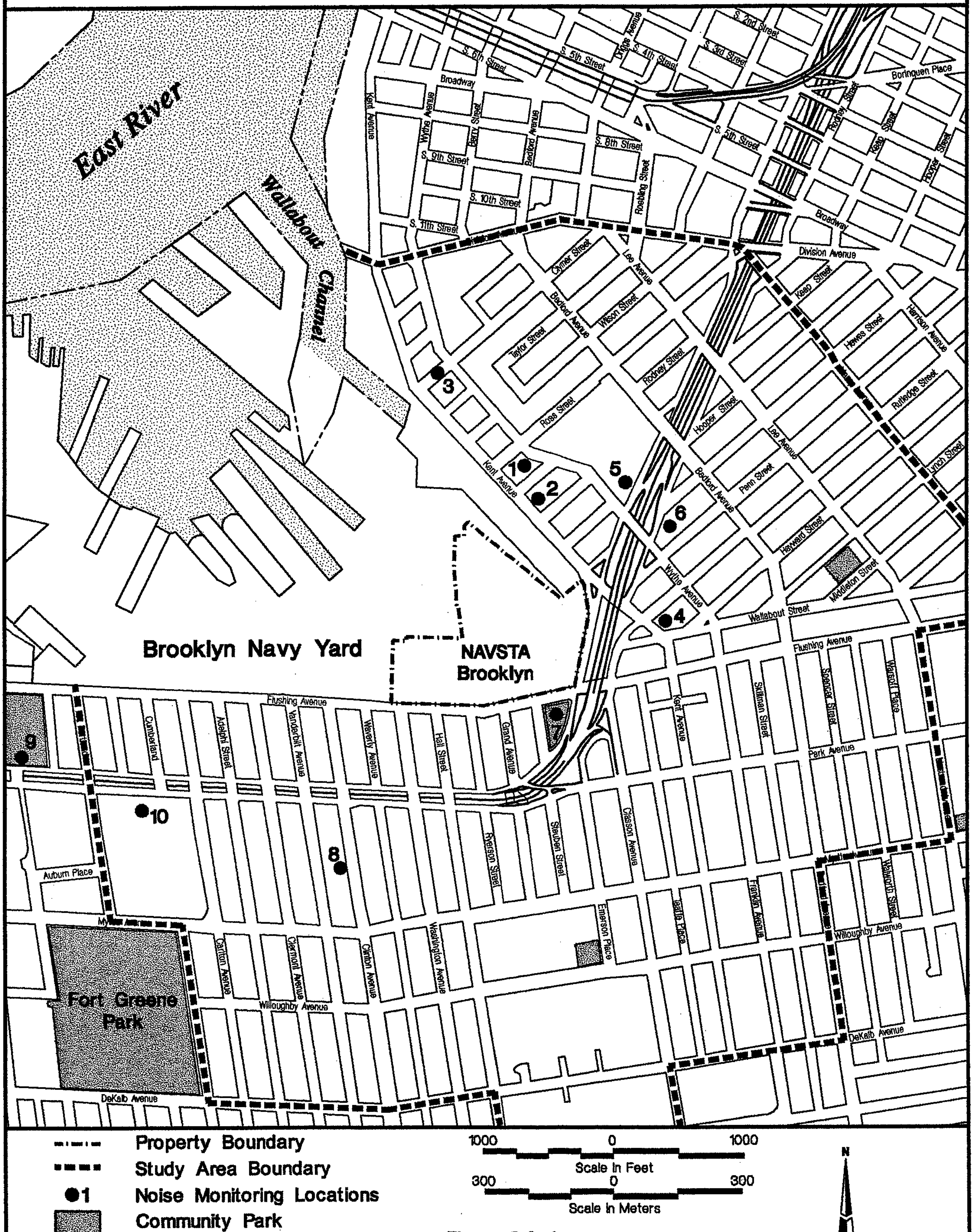


Figure 3.6-1

Site 6: Midblock on Williamsburg Street between Wythe Avenue and Bedford Avenue. This site is in front of a six-story apartment building on the west side of the BQE near the southbound exit.

Site 7: Playground along Flushing Avenue between Steuben Street and Emerson Place. This site is located near the NAVSTA gate and opposite the southeast corner of the project site.

Site 8: 104 Clinton Avenue. Midblock on Clinton Avenue between Park Avenue and Myrtle Avenue. This site is in front of two-story residential houses.

Site 9: Commodore John Barry Park along the north side of Park Avenue between North Elliott Place and Navy Street.

Site 10: North Oxford Walk Housing Complex on the south side of Park Avenue between Carlton Avenue and North Portland Avenue. This site is near the playground of the six-story apartment building complex.

The field monitoring program was conducted using the following equipment:

- Bruel & Kjaer Sound Level Meter Type 2231;
- Bruel & Kjaer Sound Level Calibrator Type 4230;
- Bruel & Kjaer Microphone Type 4155; and
- Bruel & Kjaer Graphics Printer Type 2318.

Microphone height for all receptors was eight ft (2.4 m) above ground level. A wind screen was used to minimize wind noise across the face of the microphone. During each sampling, a sound signal was obtained by the microphone unit and transferred to the noise analyzer. Measurements at each sampling location were made on the A-scale (dBA) for a sampling period of 15 minutes. The data were digitally recorded by the noise analyzer and displayed at the end of the measurement period in units of dBA L_{eq}, L_1, L_5, L_{10}, L_{50}, and L_{90}.

3.6.4 Existing Noise Levels

The one-hour equivalent noise levels [L_{eq} (1)] measured at Sites 1 through 10 are presented in Table 3.6-4. At all measurement locations, the predominant source of noise was vehicular traffic on adjacent local roadways and the BQE. This was reflected in the measured noise levels, which were common for an urban area. While not directly applicable, the USHUD and FHWA noise criteria provide a useful yardstick by which to assess the existing noise environment in the study area:

Table 3.6-4

Existing Monitored Sound Levels (in dBA)

Site	Time Period				24-Hour L_{eq}	L_{dn}
	AM Peak (7 - 9 am)	Midday (10 am -2 pm)	PM Peak (5 pm -7 pm)	Pre-Midnight (9 pm -12 am)		
1	62.3	61.1	61.7	59.6	60.2	64.4
2	69.3	70.0	72.0	66.3	68.7	72.1
3	64.1	65.0	64.6	60.6	63.0	66.7
4	69.9	68.7	68.1	66.8	67.6	72.6
5	68.9	67.7	69.6	63.7	66.6	69.8
6	70.6	68.7	71.1	64.8	68.1	71.3
7	71.9	69.0	68.0	68.5	68.3	73.3
8	60.5	64.3	63.3	62.7	61.9	67.0
9	73.2	73.4	73.1	71.6	71.5	75.6
10	71.3	72.2	70.8	69.5	70.1	74.1

- The USHUD criterion for residential land use is exceeded when the L_{dn} exceeds 65 dBA. Based on existing noise levels, the $L_{dn} = 65$ is exceeded at all sites except Site 1.

- The FHWA criterion for Activity Category B land uses (residential, parkland, hospitals, etc.) is 67 dBA [L_{eq} (1)]. Existing noise levels exceed the FHWA criteria at Sites 7, 9, and 10 during all four identified hourly periods and at Sites 2, 4, 5, and 6 during the am, midday, and pm periods. At the other three sites (Sites 1, 3, and 8), the existing noise levels do not exceed FHWA criteria.

- The NYC CEPO-CEQR L_{eq} (1) guidelines are exceeded when the noise level exceeds 65 dBA during the daytime (7 am to 10 pm). During the daytime, the 65 dBA level is exceeded at all sites except Sites 1, 3, and 8.

- According to the NYC CEPO-CEQR L_{10} guidelines, Sites 1, 3, and 8 are considered "marginally acceptable" (Table 3.6-5), and the rest of sites are considered "marginally unacceptable" with respect to external noise conditions.

In conclusion, it may be determined that the site and immediate study area have relatively high noise levels typical of a busy urban area near an interstate highway, in this case the elevated BQE.

Table 3.6-5

Existing Monitored Maximum L_{10} Levels

Site	L_{10} in dBA	Time Period	CEPO-CEQR Guidelines
1	66.0	AM	Marginally Acceptable
2	75.0	PM	Marginally Unacceptable
3	68.8	Midday	Marginally Acceptable
4	73.8	AM	Marginally Unacceptable
5	73.3	PM	Marginally Unacceptable
6	74.2	PM	Marginally Unacceptable
7	74.6	AM	Marginally Unacceptable
8	67.1	PM	Marginally Acceptable
9	76.1	PM	Marginally Unacceptable
10	74.1	Midday	Marginally Unacceptable

3.7 Infrastructure

This section describes the existing utility systems at NAVSTA Brooklyn, and is based on information presented in *Redevelopment Plan for Naval Station Brooklyn, New York* (City of New York, 1996), the *Environmental Assessment for Base Realignment and Closure of Naval Station New York at Brooklyn* (Ecology and Environment, Inc., 1989), and communication with persons directly responsible for the care and upkeep of the facility. Information presented in the following section has been determined, in some cases, from existing drawings of the respective utility systems.

3.7.1 Electricity

Electrical service to NAVSTA Brooklyn is provided by Consolidated Edison Company (Con Ed). One building on the site, Bldg 311, is served directly by Con Ed via a 27-kilovolt (kV) line. Another 27-kV feeder line enters the site at Flushing Avenue, between Ryerson Street and Grand Avenue, and proceeds directly to a transformer located in Bldg 8 (SW Electrical Substation). The Bldg 8 substation serves Bldgs 1, 2, 3 and 5 in the western industrial area. At the Bldg 8 substation, step-down transformers reduce the incoming power into usable voltages. Power is then distributed via 13.8 kV feeders to electrical switching stations through out the site. Distribution throughout NAVSTA Brooklyn is underground (Ronaldson, May 11, 1999).

3.7.2 Steam

Historically, a 286-megawatt (MW) gas-fired combined-cycle cogeneration facility (Bldg 41), owned and operated by the BNYDC, was the primary source for supplying all of NAVSTA Brooklyn with heat (Mann, May 20, 1999). The facility, which uses clean natural gas to power two 103-megawatt combustion turbine generators and two 40-megawatt steam turbine generators, produces steam and electricity while employing state-of-the-art pollution control systems. The plant is capable of generating steam at a rate of one million pounds per hour (lbs/hr). The steam line which supplies the NAVSTA Brooklyn site is capable of supporting at least 100,000 lbs/hr of steam (Risolo, June 11, 1999). Buildings in the western industrial area of the site (Bldgs 1, 2, 3, and 5) still utilize this steam at an average of nine million pounds (four kilograms) per month during the winter season, at a cost of close to $1 million per year. There are currently unrepaired leaks that impair the efficiency and cost-effectiveness of the steam distribution system.

The remainder of the NAVSTA Brooklyn site is no longer provided steam by the cogen facility. These lines are beyond repair and are no longer useable. Buildings in other areas of the NAVSTA Brooklyn site that are currently occupied utilize electric baseboard heat (Bldgs 8 and 9). Those which are not occupied will remain heatless (Ronaldson, May 11, 1999).

3.7.3 Sewage

According to the NYCDEP, NAVSTA Brooklyn's sewer system is in poor condition (City of New York, 1996). The sanitary system and storm system are interconnected at several points on the site, and there are multiple locations where sanitary and storm pipes are directly connected as they leave buildings.

Sanitary sewage generated at NAVSTA Brooklyn is discharged into the combined sewer lines of the New York City Sewer System, maintained and operated by the NYCDEP. The NYCDEP maintains a 138-in (351-cm) sewer line along Flushing Avenue and Williamsburg Street West, which is connected at the intersection of Hewes Street and Kent Avenue to a 198-in (503-cm) sewer line along Kent Avenue.

Although the Red Hook Water Pollution Control Plant (WPCP) is located on a 19-acre (7.7-hectare) site in the northwest corner of the Brooklyn Navy Yard, the sanitary discharge from NAVSTA Brooklyn is directed north to the Newtown Creek WPCP. The WPCP, located at 301 Greenpoint Avenue, Brooklyn, opened in 1967 with a design capacity of 310 million gallons per day (mgd) (1.2 billion liters per day [bld]) dry weather flow. The plant can handle 620 mgd (2.3 bld) during wet weather, when large volumes of rainfall runoff enter the combined sewer system through drains along the site and streets. The drainage basin serviced by the WPCP is 15,656 acres (6,336 hectares), encompassing the southern and eastern sections of Manhattan, the northernmost section of Brooklyn, and the southwestern portion of Queens. The population connected to the Newtown Creek WPCP is approximately 1,039,294 people.

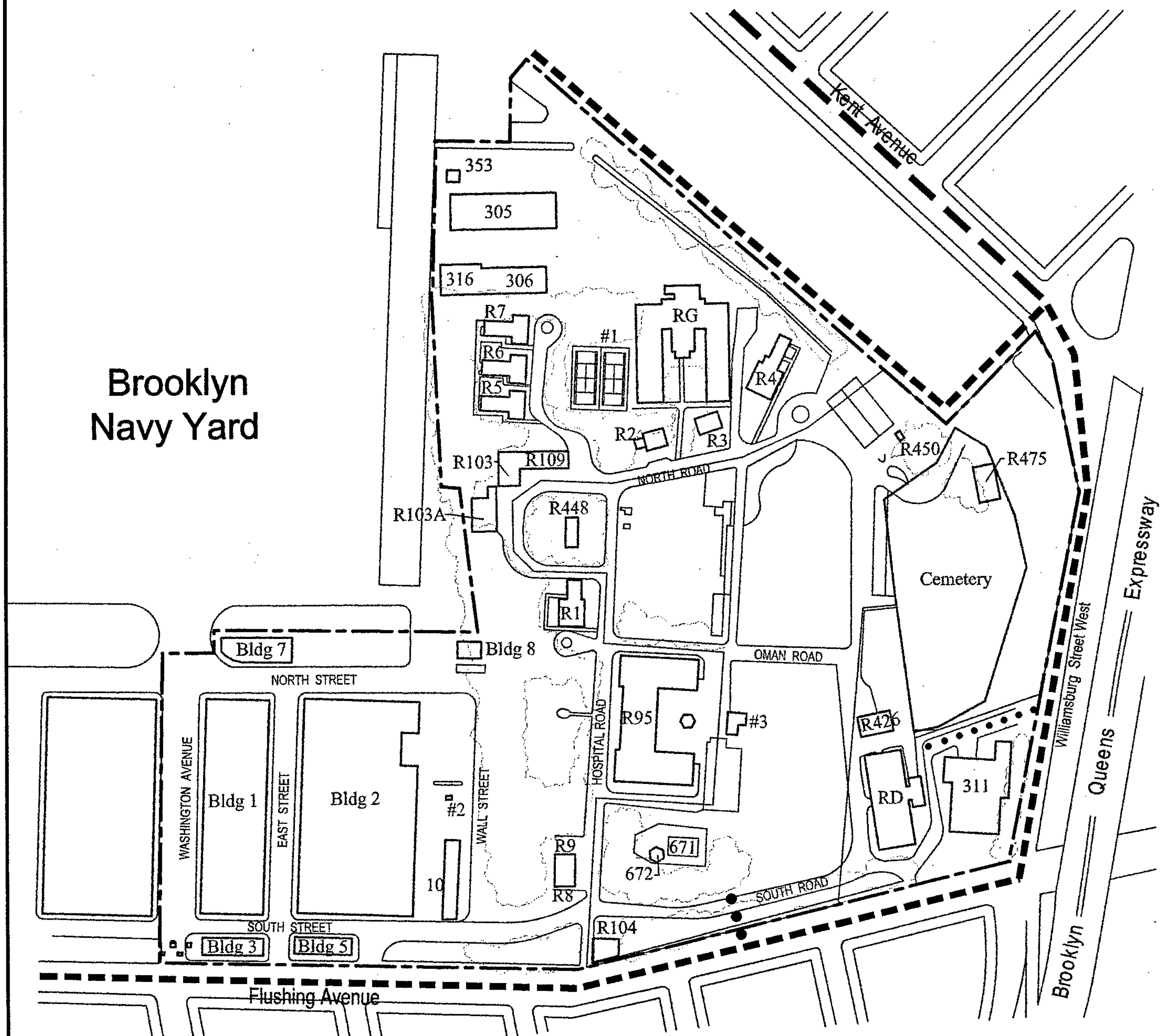
Sanitary sewage from NAVSTA Brooklyn is directed from the site via 12- and 24-in (31- and 61-cm) sanitary piping to the 138-in (351-cm) combined sewer lines. The 12-in pipe connects from the site to the 138-in sewer line along Williamsburg Street West, while the 24-in pipe connects from the site to the 138-in sewer line between Ryerson Street and Grand Avenue (Figure 3.7-1, NAVSTA Brooklyn Sewer Lines).

3.7.4 Natural Gas

Natural gas for the site is supplied by the Brooklyn Union Gas Company. The major gas pipelines surrounding the site are located along Flushing and Kent Avenues. At Flushing Avenue, there are two high-pressure gas mains that feed into the site: a 16-in (41-cm) line and a 12-in (31-cm) line. At Kent Avenue, there are a 20-in (51-cm) line and a 6-in (15-cm) line (Maltz, May 21, 1999).

Smaller low-pressure gas lines feed off these high-pressure gas mains directly into the site at several connections. At the intersection of Flushing and Washington Avenues, an 8-in (20-cm) line enters the site from the 20-in (51-cm) main, where it is connected to a 6-in (15-cm) line which feeds

NAVSTA Brooklyn Sewer Lines



- 138" Sewer Line
- 198" Sewer Line
- 12" Sewer Line
- 24" Sewer Line
- Property Boundary
- Building

250 0 250
Scale in Feet (Approximate)

50 0 50
Scale in Meter (Approximate)

N

Figure 3.7-1

directly into Bldg 1. The remaining portion of the 8-in line, which runs north along Washington Avenue through the site, is now retired. A second 4-in (10-cm) connection feeds off the 12-in (31-cm) main on Flushing Avenue and is located between the Gate House (Bldg R104) and the Bachelor Enlisted Quarters (Bldg RD). There are two additional lines from the 12-in line into the site, in the vicinity of the Bachelor Enlisted Quarters (Bldg RD), that are now retired. At the intersection of Flushing Avenue and Williamsburg Street West, the 20-in main interconnects with a 12-in line that feeds directly into Bldg 311.

There are two connections to the site along Kent Avenue. A 6-in (15-cm) line enters the site at the intersection of Hewes Street and Kent Avenue from the 6-in line, and a 3-in (8-cm) line feeds off the 20-in (51-cm) main into the site at the intersection of Hooper Street and Kent Avenue. The gas lines within the site are of varying capacities and follow a maze-like route through the site.

Only the western industrial area of the site (Bldgs 1, 2, 3, and 5) currently receives natural gas from Brooklyn Union Gas. All other NAVSTA Brooklyn buildings on site have had their gas lines cut and are no longer supplied with natural gas (Ronaldson, June 2, 1999).

3.7.5 Stormwater

Stormwater runoff from the site is collected in catch basins and storm drains located throughout the site (Ronaldson, June 2, 1999). The catch basins and storm drains convey the stormwater from NAVSTA Brooklyn to the combined sewer lines of the New York City Sewer System. During wet weather, large volumes of rainfall runoff enter the system and are combined with the sanitary sewage flow from the site. Regulators built into the combined sewers act as relief valves. These chambers are set to handle two times the dry weather flow into the WPCP. If this flow is exceeded, the excess is directed to outfalls into the nearest waterway.

A wet-weather discharge from the combined sewers that exceeds the capacity of the WPCP would be detected along Kent Avenue, near the intersection of Taylor Street, and the overflow would be discharged into Wallabout Channel via a 198-in (503-cm) line.

3.7.6 Water Supply

Potable

Water is provided via the NYC water transmission and distribution system, which obtains its supply from surface water reservoirs in the Delaware River, Hudson-Mohawk, and Hudson River basins. Water lines enter the site at the intersection of Ryerson Street and Flushing Avenue via a 10-in (25-cm) line. There are 20-in (51-cm) water mains surrounding the site along Flushing and Kent Avenues

and Williamsburg Street West (Figure 3.7-2, NAVSTA Brooklyn Water Lines). The water distribution system is adequate to service existing buildings within the site, although there are probable leaks (City of New York, 1996).

Fire Protection

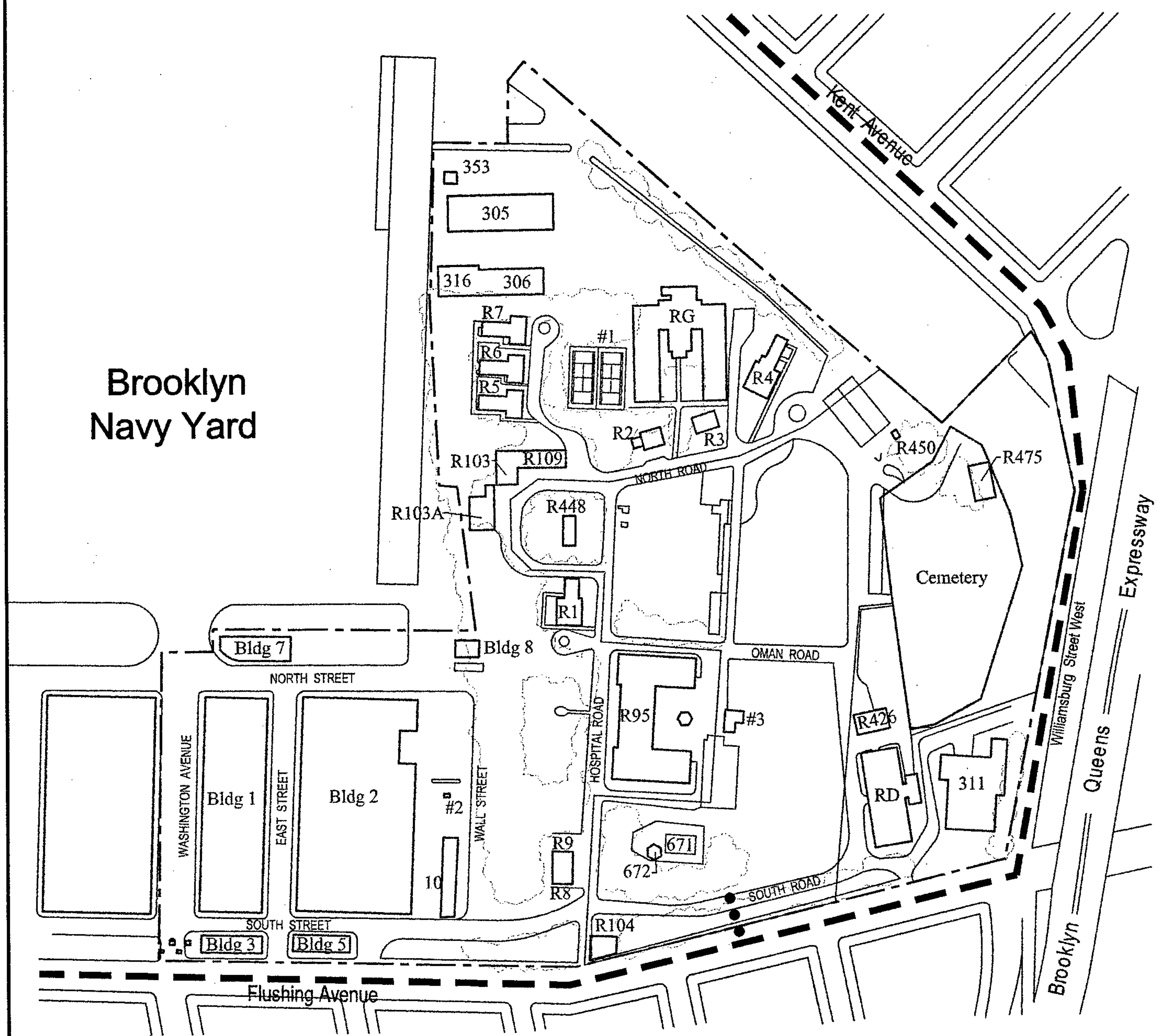
Fire protection at NAVSTA Brooklyn is designed in accordance with National Fire Protection Association (NFPA) recommendations and as approved by the local fire official. The distribution system supplying domestic water to NAVSTA Brooklyn also supplies the facility's sprinkler systems and fire hydrants. The fire hydrants are located throughout the facility and are spaced at a maximum of 500 ft (152 m) to ensure that the entire site has sufficient fire-fighting capabilities (Ronaldson, June 2, 1999).

3.7.7 Solid Waste

In New York City, municipal solid wastes are collected by the Department of Sanitation. These wastes include wastes generated by residences, non-profit institutions, and City agencies, but do not include construction debris, asbestos, or hazardous industrial materials from these sources. Commercial establishments (i.e., restaurants, retail, offices, industries, etc.) are required to contract with private carters for waste collection and disposal. After collection, most nonrecycleable waste is taken to transfer stations, where it will eventually be loaded for disposal in a landfill. From the transfer stations, most of the City's nonrecycleable waste is transported to the Fresh Kills landfill on Staten Island, where it is buried under controlled conditions.

Residential solid wastes at NAVSTA Brooklyn are contained in a 2 cubic yard (cu yd) (1.54 cu m) container, which is picked up once a week, at a cost of $150 per month. Other wastes (i.e., construction debris) at the site are contained in a 30 cu yd (23.1 cu m) container, which is picked up five or six times per year, at a cost of $500 for each pick up. NAVSTA Brooklyn has contracted privately with Basin Haulage to pick up the waste containers as described (Ronaldson, August 2, 1999).

NAVSTA Brooklyn Water Lines



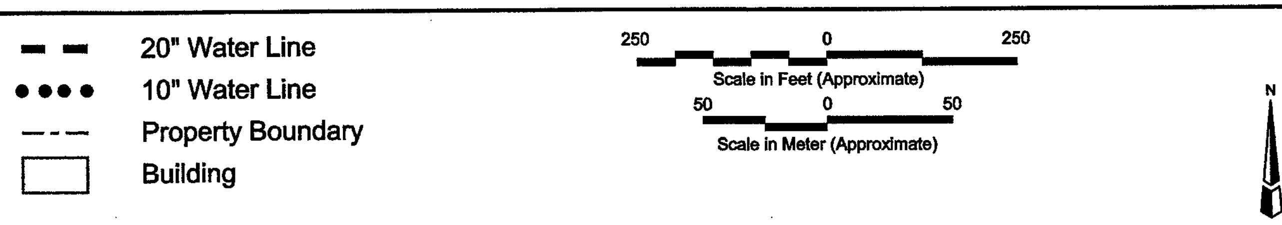


Figure 3.7-2

3.8 Cultural Resources

The Navy has undertaken a series of cultural resources evaluations of NAVSTA Brooklyn. These reports were prepared in compliance with the following laws and regulations requiring that cultural resources meeting the eligibility criteria of the National Register of Historic Places be identified and evaluated:

- Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966, as amended;
- EO 11593, Protection and Enhancement of the Cultural Environment;
- NEPA; and
- Chief of Naval Operations Instruction (OPNAVINST) 5090.1B, Environmental and Natural Resources Program Manual.

These evaluations addressed both general and specific aspects of NAVSTA Brooklyn's cultural resources, including its architectural and archaeological resources, and are:

- *Cultural Resources Survey for Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York* (US Navy, 1994);
- *Archaeological Evaluation (Stage 1A Documentary Study) Naval Station (NAVSTA) New York Navy Yard Annex Site* (US Navy, 1997a);
- *Ground-Penetrating Radar Evaluation, Navy-Retained Section (former) Brooklyn Navy Yard* (US Navy, 1997b);
- *State of the Research, Naval Hospital Cemetery NAVSTA Brooklyn Historical Documentation* (US Navy, 1998a); and
- *Archaeological Evaluation (Phase 2 Study) Former US Naval Hospital Archaeological Features* (US Navy, 1998b).

These studies are discussed in further detail in Subchapters 3.8.3 and 3.8.4.

3.8.1 Overview of Prehistoric and Historic Periods

The following sections provide a prehistoric and historic overview of the development of the NAVSTA Brooklyn site, including the development of the Brooklyn Navy Yard, Naval Hospital campus, and the cemetery that comprise the site. In this subchapter, buildings within the NAVSTA Brooklyn site are referred to by their historic name with the Navy number in parentheses (rather than their current name). Refer to Table 2.1 for the historic name, current name, and building number of all structures on the NAVSTA Brooklyn site.

Prehistoric Background

Approximately 12,500 to 10,000 years before present (BP), Paleoindians first arrived in the northeast following the retreat of the Wisconsin glacier. It has been recognized by archaeologists that rising sea levels caused evidence of Paleoindian occupations to be lost in coastal regions (Thorbahn, 1982; Edwards and Emery, 1977). Although no Paleoindian sites have been identified on Long Island or Brooklyn, a Paleoindian component was located on the Port Mobile Site, in Staten Island, NY (Ritchie, 1965).

Vegetation during this early period consisted of spruce boreal forest, which was followed by a mixed coniferous/deciduous zone of predominately pine, spruce, and birch. The evolution of adaptive strategies oriented to mixed deciduous/coniferous forests, and eventually the increased importance of coastal resources, provides the basis for the Archaic Period (ca. 10,000-3000 BP). This period is marked by the gradual development of a more complex, localized land use strategy focusing on a wider resource base than that of the preceding period. The earliest evidence of Native American utilization of coastal resources (shell fishing) has also been documented from this period (Snow, 1908). Identified Archaic sites are significantly more numerous than Paleoindian sites, although none have been documented in NAVSTA Brooklyn or the immediate vicinity.

The Woodland Period (ca. 3000-500 BP) demonstrates a continuation of the shift from generalized hunting and gathering to the more specialized exploitation of wild resources, including marine shellfish and annual fish runs (Snow in Trigger, ed., 1978). The emergence of the salt marsh allowed for the increasingly intensive exploitation of the coast, such as in the vicinity of NAVSTA Brooklyn, during this time period. Sites grew generally larger, with semi-sedentary fortified villages being established at the end of the period. One archaeological site dating to the Woodland Period was identified in the vicinity of NAVSTA Brooklyn by non-professional archaeologists during the mid-19th to early 20th century. This site, located outside the western periphery of the former Brooklyn Navy Yard, yielded diagnostic artifacts such as clay pipes, pottery, and projectile points. No Woodland Period sites have been identified within NAVSTA Brooklyn itself.

Historic Period, 1600s - 1800

During the 1620s, the land that eventually comprised the Brooklyn Navy Yard was privately owned by the Rapelyes, a Dutch Huguenot family who originally purchased the 335-acre (135.6-hectare) tract of high ground, meadow, and swamp from the Native Americans. The parcel was bounded by two hills situated around Wallabout Bay. Throughout the 17th and 18th centuries, the Rapelyes and their descendants (Schenck, Bergen, Bogart, Vanderbeck, Remsen, Johnson, Jackson, et al) lived along Wallabout Bay and prospered by selling their agricultural products to neighboring communities. Notable settlements on the site included Rem Remsen's mill, dam, and toll bridge, established during the early 1700s, on 70 acres (28.3 hectares) along the western strand of Wallabout Bay. Other features included the farmstead of Martin Schenk, Jr., a direct descendent of the Rapelyes. The farmstead contained a house, barn, outbuildings, and farmland. The house on the Schenk farmstead would later became part of the Naval Hospital campus (US Navy, 1994).

After four generations, the Rapelye land was divided into small parcels and sold to, or inherited by, numerous heirs. In 1781, the Jackson brothers purchased property surrounding the west hill of the Remsen mill property, and constructed a shipyard. These holdings would later become a portion of the Brooklyn Navy Yard.

Brooklyn Navy Yard, 1800 - 1990

In 1801, the US Navy purchased John Jackson's 41.93-acre (16.9-hectare) parcel, including the shipyard site and part of the west hill, for establishment of the Brooklyn Navy Yard. At the time of its construction, the Navy Yard was one of six commissioned by the Navy. In its initial years, the yard functioned primarily as a depot for supplies, but during the early 19th century, it served as the Navy's primary shipbuilding and repair facility.

Shipbuilding activity increased with the War of 1812 when the yard fitted out more than 100 Naval vessels. During the mid-19th century, the growth of shipping and port activities in New York City further enhanced the Navy Yard's development. Numerous ships were built and repaired in the shipyard, and spurred the construction of the granite Dry Dock Number One in 1841-1851. The dock, located outside the NAVSTA Brooklyn site, has been designated a New York City landmark (US Navy, 1994).

During the Civil War, the Brooklyn Navy Yard was the Union's most important shipyard, employing 6,000 workers at the close of the war. It built vessels, converted private ships to military use, and repaired more ships than any other yard in the nation. In the decade following the Civil War, new ship construction slowed considerably, and arms and munitions storage became part of the yard's mission. However, by the 1880s, shipbuilding re-emerged as a primary activity at the Navy Yard, and new dry docks were constructed to accommodate these needs (US Navy, 1994).

The boundaries of the Brooklyn Navy Yard changed in 1890 with the sale of lands on the east side of the yard to the City of Brooklyn. The lands were bounded by Flushing Avenue on the south, Washington Street on the west, the Naval Hospital perimeter wall on the east, and Wallabout Place on the north and northeast. On this property the city created Wallabout Market, the city's only public wholesale market. It was housed in blocks of two-story, Dutch-style buildings with elaborate stepped and ornamented gables that lined the west and south sides of the open "Farmer's Square." An additional group of six buildings were sited on Flushing Avenue and smaller streets (i.e., from west to east, West Street, Market Street, and East Avenue) running north into Farmer's Square. These street names continue to be used today at the Brooklyn Navy Yard. The market separated the Navy Yard from the Naval Hospital complex, which is described below.

During the Spanish-American War (1898), the Brooklyn Navy Yard became the Navy's principal supply center. With changes in technology and scale of ship design in the early twentieth century, newer, larger facilities were needed. During the early 1900s, shipways were rebuilt and new dry docks were constructed. In addition, a perimeter wall of concrete caissons, sunk by the pneumatic method, was built around the complex (US Navy, 1994).

In the early 20th century, the Brooklyn Navy Yard emerged as one of the leading yards in large-vessel construction. As World War I escalated, the Navy Yard's employment tripled, going from its civilian peak of 6,000 to more than 18,000 civilians by war's end. More than 60 ships, mostly fishing boats and yachts, were outfitted to hunt U-boats, and captured German ships were re-outfitted for Navy use. During this period buildings within the yard were remodeled to accommodate new uses; other improvements included the construction of streets, tracks, and sewers; power plant upgrades; and waterfront enhancements (US Navy, 1994). After World War I, ship repairs became the main mission of the Brooklyn Navy Yard, and employment dropped.

During World War II, expansion of the Brooklyn Navy Yard was the most comprehensive and complex construction program of all Navy Yards in the nation, as a result of a 1940 Congressional directive calling for expansion of buildings and structures within the yard and development of its east end, including the current NAVSTA Brooklyn site. Some of the new construction also occurred near Wallabout Market. The market area was improved through dredging and removal of all market buildings except the stable and storage building (Bldg 305) (ca. 1896). Bldg 305 remains today in the northern triangle of the NAVSTA Brooklyn site.

Other World War II-era construction included the Motion Picture Exchange (Bldg 311) in the BQE frontage sector and various storage buildings in the northern triangle of the site, including:

- Storage and operation building (Bldg 306);
- Transportation maintenance shop (Bldg 316); and
- Storage building (Bldg 353).

New construction in the western industrial sector of the site included (US Navy, 1994):

- Materials testing lab (Bldg 1);
- Foundry (Bldg 2);
- Gate and guard house (Bldg 3);
- Central bank (Bldg 5);
- Electrical substation (Bldg 7);
- Electrical substation and transformer (Bldg 8);
- Public works storage bins (Bldg 10); and
- Main gate..

The Navy Yard's workforce and production scale were reduced at the close of World War II, but expanded again during the Cold War and Korean conflicts of the 1950s. Carriers for jet operations and antisubmarine warfare were remodeled, and several large carriers were built. In 1966, the Brooklyn Navy Yard became one of 90 military bases and installations to be closed as an economic measure by then-Secretary of Defense Robert S. McNamara. Ownership of the former yard, excluding the NAVSTA Brooklyn site, was transferred to the City of New York; it is presently operated as an industrial park managed by the city's Brooklyn Navy Yard Development Corporation (BNYDC).

The NAVSTA Brooklyn site (including the northern triangle, western industrial sector, BQE frontage area, and hospital campus) became the administrative headquarters of NAVSTA New York, which was comprised of three sites in Brooklyn (NAVSTA Brooklyn, Dayton Manor, and Floyd Bennett Field), one site on Staten Island (NAVSTA New York, Staten Island), and one site on Long Island (Mitchel Field/Mitchel Manor). Until NAVSTA Brooklyn's closure under BRAC in the early 1990s, buildings within the northern triangle, western industrial sector, and BQE frontage area served administrative, security, and limited operational functions (US Navy, 1990).

Naval Hospital Campus, 1811 - 1990

In 1811, the Commandant of the Brooklyn Navy Yard requested aid from Congress to construct a Naval Hospital on the location of the Schenk farm, east of the Navy Yard on Wallabout Bay. By May 1824, roughly 25 acres (10 hectares), including buildings, were purchased by the Navy. Early 19th century documents suggest that structures on the former Schenk property may have been used as an interim hospital facility while construction of the new Naval Hospital was underway; another temporary-hospital candidate, Remsen's mill (now a decrepit building on the west side of the Brooklyn Navy Yard), had been deemed unfit for patients (US Navy, 1994, 1997a).

In 1838, construction of the Brooklyn Naval Hospital (Bldg R95) was completed. The Greek Revival-style hospital, designed by Martin E. Thompson (a prominent architect of other New York City military buildings), was designated a New York City landmark in 1965 and has been determined to be individually eligible for listing in the National Register of Historic Places (US Navy, 1994).

During the Civil War, the Naval laboratory at the hospital prepared most of the medicines used by the Union Navy. It is estimated that, at the time, the Naval Hospital accommodated about 25 percent of the total Civil War patient load of all Naval hospitals.

In the 1840s, the former Schenk dwelling (Bldg R4) was altered to become the Doctor's House. This included shifting its orientation from east-west to north-south, at which time Italianate details were added to the house (US Navy, 1997a). Other buildings altered during this era included the hospital, when a wood addition was erected to connect the north and south wings of the building. This section was removed after 1867. In 1850, the Gate and Guard House (Bldg R104) was erected within the hospital campus property. In addition, it is likely that portions of the brick-and-stone perimeter wall that surrounded the north and west sides of the hospital campus were built at this time. The wall is still extant within the NAVSTA Brooklyn site (US Navy, 1994).

In 1864, the Surgeon's House (Bldg R1) was erected at the site. This Italianate/Second Empire-style house, designed by True Hollins and Charles Hastings, was designated a New York City landmark in 1975 and has been determined to be individually eligible for listing in the National Register of Historic Places (US Navy, 1994).

In 1891, a 17-acre (6.8-hectare) tract, including two acres (0.81 hectares) in the hospital campus, was sold to the city of Brooklyn and developed as the Wallabout Market previously described. By the mid-1890s, 17 buildings were located on the hospital campus. According to an 1895 map, multiple buildings that no longer exist were located east and south of the hospital. For example, a court building was located east of the hospital within the hospital's U-shaped courtyard. A kitchen building, laundry, and boiler house were appended to the court building by an east/west corridor. Two north/ south spurs extended south from the east/west corridor to connect to a coal shed south of the boiler house and a ward building south of the hospital. The freestanding Naval laboratory was located north of the boiler house and east of the hospital (US Navy, 1997a). None of the buildings south and east of the hospital survive today.

The following 19th-century buildings remain intact within the hospital campus:

- Naval Hospital (Bldg R95);
- Surgeon's House (Bldg R1);
- Doctor's House (former Schenck house) (Bldg R4);
- Gate and Guard House (Bldg R104);
- Smallpox hospital and stable (Bldg R103); and
- Stable for Surgeon's House (Bldg R109).

In 1905 new Officers' Quarters (Bldgs R2 and R3; also known as West House and East House) were erected, west of Bldg R4, within the hospital campus property. A new mortuary was built in 1909 (Bldg R426), and a new laboratory (Bldg RD) was designated as the Medical Supply Depot in 1910. The earlier laboratory was converted to a 60-bed ward and incorporated into the Naval Hospital via

a covered walkway. Projects from this period also included grading northwest of the hospital, installation of sidewalks around Bldgs B1 and B2, and street improvements around the new laboratory (Bldg RD). Bldg R4, the former Schenck house, was enlarged in 1909 (US Navy, 1994). During World War I, emergency hospital expansion resulted in the construction of multi-winged brick wards, collectively identified as Bldg C, on the lawn immediately north of the hospital. In addition, the South Annex ward was constructed south of the hospital in the current location of the pool (US Navy 1997a). In 1919, the Nurses' Quarters (Bldg RG) was completed near the northern border of the hospital campus.

In 1926, Bachelor Officers' Quarters (Bldgs R8 and R9) were erected southwest of the hospital. During this same period, the Memorial Area was established northwest of the hospital on land that had been disturbed by cutting and filling in 1842 (US Navy, 1997a).

By 1936, the majority of land within the hospital campus had been developed (Figure 3.8-1, US Naval Hospital Brooklyn, 1936). Bldg E, a multi-winged ward, was built east of Bldg C. The laundry/boiler house east of the hospital was converted to Bldg F and A Annex. The South Annex was renamed Bldg B. Very little open space existed within the hospital campus, and what remained was confined to the Memorial Area northwest of the hospital and the lawn south of Bldg F.

During World War II, hospital operations had outgrown their restricted site, and a new Naval Hospital was erected in St. Albans, Queens. In 1948 the Brooklyn Naval Hospital was decommissioned, but the hospital campus remained utilized and unaltered for several decades. The NAVSTA Brooklyn site, including the hospital campus, became the administrative headquarters of NAVSTA New York (previously described). The hospital buildings and land were used for administrative, recreational, security, limited operational, and housing purposes.

In 1978, a pool and bath house were erected south of the hospital in the former location of Bldg B. Between 1979 and 1981, multiple buildings on the hospital campus were demolished, including the original laboratory, power plant, and Bldgs C, E, and F (US Navy, 1994; Stokes, February 20, 1992). Demolition of these structures resulted in the current hospital campus configuration, as depicted in Figure 3.8-2 (National Register-Eligible Properties at NAVSTA Brooklyn). There is currently open space north of the hospital in the former locations of Bldgs C and E, and east of the hospital in the former location of Bldg F. The Memorial Area and cemetery are also depicted as open space.

In the early 1990s, NAVSTA Brooklyn was closed as directed by BRAC. In 1992, the NY State Historic Preservation Office (SHPO) determined that the Naval Hospital campus was eligible for listing as a historic district in the National Register of Historic Places (US Navy, 1994).

Naval Hospital Cemetery, 1824 - 1926

The Naval Hospital Cemetery, located within the grounds of the Naval Hospital campus, served as the hospital's official burial ground from 1824-1910. The land upon which the cemetery was established was purchased from the Schenck family in 1824 as part of the original hospital land acquisition. Records from the Navy's Bureau of Medicine & Surgery (BUMED) indicate that bodies may have been interred at the cemetery as early as 1812, prior to the official establishment of the cemetery (US Navy, 1997a).

In 1842 the burial ground was expanded by filling the marshy land along its eastern edge using materials removed from land west of the hospital (US Navy, 1997a). By 1899, the northwestern portion of the cemetery was expanded to accommodate an additional 100 graves. During the early 20th century, the Surgeon General of the United States denounced the cemetery's condition as deplorable and, in 1910, the cemetery was closed to new interments (US Navy, 1994).

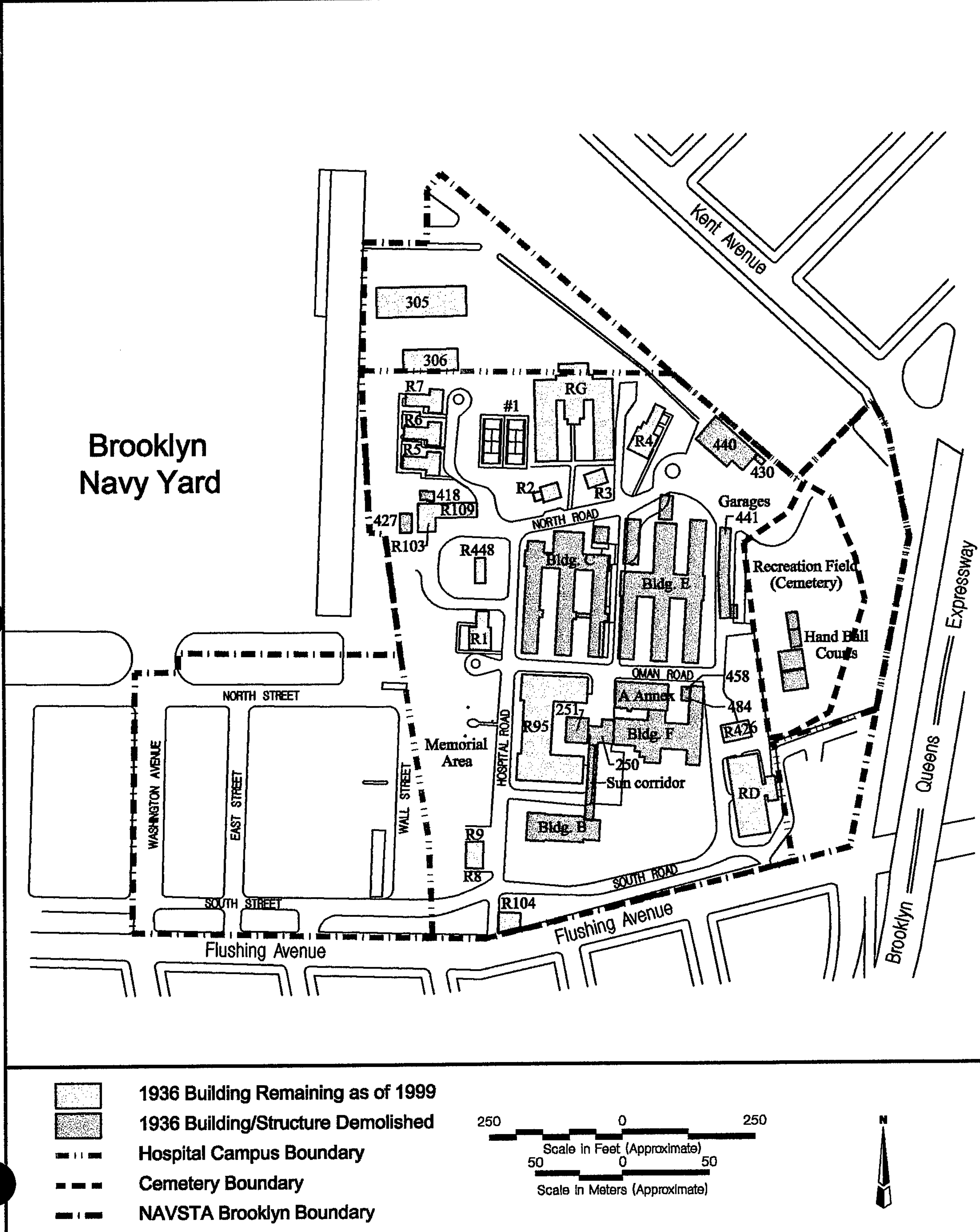
In 1926, the Navy removed 907 burials from the cemetery and reinterred them at Cypress Hills National Cemetery in Brooklyn, and considered the cemetery as having been removed. However, documentary research indicates that as many as 517 interments are not documented as ever having been removed (US Navy, 1997a, 1998; see Subchapters 3.8.3 and 3.8.4).

As the Navy believed that the cemetery was gone, between the 1930s and 1940s a recreational field was constructed in the northern portion of the cemetery (Figure 3.8-1). After 1944, the Navy added infrastructure to the field and constructed a tennis court in the southern section, which was later removed. Significant grading also occurred at the cemetery site at this time. By 1964, the northern portion of this field was converted into a paved parking lot and, during the 1970s, the Navy added baseball and football fields to the southern portion (US Navy, 1994).

3.8.2 Intensive-Level Historic Resources Survey

Documentary research was conducted on the NAVSTA Brooklyn site in order to place the facility in an appropriate historic context and determine National Register eligibility of previously unevaluated properties. This research is presented in *Cultural Resources Survey For Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York, Brooklyn, NY* prepared by the US Navy in 1994. Investigations focused on the development history of the Brooklyn Navy Yard, with special emphasis on the Naval Hospital campus. Sources used in preparation of the prehistoric and historic overviews included local histories, periodicals, Navy administrative records, and historic maps and documents. Individuals such as enlisted and civilian US Navy personnel were consulted, as was the staff of the SHPO, the NYC Landmarks Preservation Commission (NYCLPC), and R. Christopher Goodwin & Associates, who were in the process of

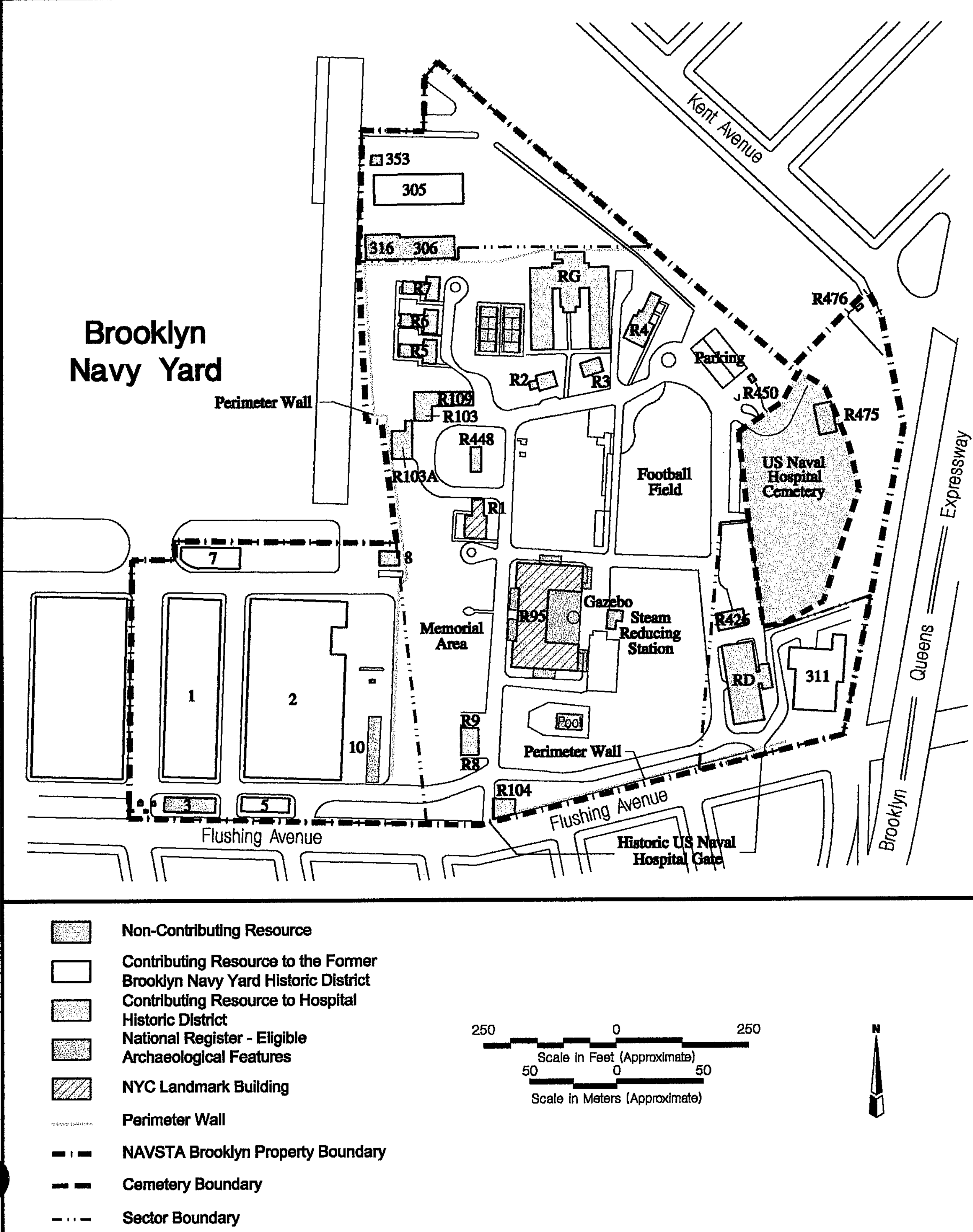
US Naval Hospital Brooklyn, 1936



Source: Office of US Naval Medicine, Bureau of Medicine and Surgery, 1936.

Figure 3.8-1

National Register-Eligible Resources at NAVSTA Brooklyn



Source: NYC Redevelopment Plan, 1996.

Figure 3.8-2

preparing *Historic Context for Department of Defense, World War II Permanent Construction* (US Army Corps of Engineers, 1997). Repositories consulted included the following:

- Department of Veterans Affairs, NY, NY;
- Long Island National Cemetery, Farmingdale, NY;
- Department of the Navy, Bureau of Medicine and Surgery, Department of Cemeteries, Washington, DC;
- NAVSTA New York, NY (Staten Island);
- Naval Education and Training Center Library, Newport, RI;
- New York State Office of Parks, Recreation, and Historic Preservation, Albany, NY;
- New York City Landmarks Preservation Commission, NY, NY;
- Brooklyn Public Library, Brooklyn, NY; and
- Brooklyn Historical Society, Brooklyn, NY.

Buildings, structures, and sites were evaluated according to the Secretary of the Interior's Criteria for Historic Significance (36 CFR 60.4) shown in Table 3.8-1.

The following section describes the information on historic resources compiled from the *Cultural Resources Survey* documentary research (US Navy, 1994). The conclusions on property eligibility from the 1994 report are presented after the section on previous surveys.

Previous Cultural Resource Surveys of NAVSTA Brooklyn

A review of files at both the NYCLPC and NYS Office of Parks, Recreation, and Historic Preservation (or SHPO) revealed that, prior to the Navy's 1994 survey, several historic resource surveys were made of NAVSTA Brooklyn. In 1965, the Naval Hospital (Bldg R95) was designated a NYC landmark by the NYC Landmarks Preservation Commission. In 1976, the Surgeon's House (Bldg R1) was also designated a NYC landmark (NYC Landmarks Preservation Commission 1965; 1976).

Roughly two decades later, the Navy prepared an *Environmental Assessment for Base Closure and Realignment of Naval Station New York at Brooklyn* (US Navy, 1990). The study recommended that only the Naval Hospital (Bldg R95) and Surgeon's House (Bldg R1) were eligible for listing in the National Register of Historic Places. In 1991, the SHPO concurred with the Navy on the eligibility of the Naval Hospital (Bldg R95) and Surgeon's House (Bldg R1). However, the SHPO also stated that additional buildings within NAVSTA Brooklyn should be surveyed to determine whether other eligible historic properties were located on the site (Stokes, February 20, 1991).

In 1992, the SHPO staff visited NAVSTA Brooklyn and concluded that the Naval Hospital campus constituted a locally significant, National Register-eligible historic district under Criteria A and C (Table 3.8-1). The SHPO identified contributing and non-contributing resources to the district, but did not identify the boundaries of the district. In addition, the SHPO determined that Bldg 305, the

Table 3.8-1

Criteria for Historic Significance

36 CFR 60.4, Part I	
The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:	
A.	that are associated with events that have made a significant contribution to the broad patterns of our history; or
B.	that are associated with the lives of persons significant in our past; or
C.	that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D.	that have yielded, or may be likely to yield, information important in prehistory or history.
36 CFR 60.4, Part II	
Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:	
A.	a religious property deriving primary significance from architectural or artistic distinction or historical importance; or
B.	a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
C.	a birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
D.	a cemetery which derives its primary significance from graves or persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
E.	a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
F.	a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
G.	a property achieving significance within the past 50 years if it is of exceptional importance.

stable originally associated with Wallabout Market in the northern triangle of NAVSTA Brooklyn, was a contributing resource to the hospital district. The SHPO also determined that the Memorial Area located between the Surgeon's House (R1) and the Naval Hospital (R95), and consisting of a ceremonial green, commemorative flagpole, and two ca. 1850 field cannons, constituted a significant open space within the hospital campus and was an important contributing element to the overall complex (Stokes, February 20, 1992).

The SHPO reserved judgment on non-hospital-related, World War II-era buildings within the northern triangle, western industrial sector, and BQE frontage area of NAVSTA Brooklyn, and stated that the buildings could be more effectively reviewed for eligibility by the National Park Service in consultation with Navy historians (Stokes, February 20, 1992).

In a subsequent letter offering preliminary comments on the disposition of Navy Yard properties, the SHPO reiterated that the relationship between the hospital (R95) and Surgeon's House (R1), and the immediate setting surrounding these buildings, was important to the understanding of the hospital campus over time. The SHPO advised that future plans should retain the Memorial Area and the overall military character of the site (e.g., as exemplified in its linear roadway network). In addition, the SHPO stated that the Naval Hospital Cemetery may possibly constitute an archaeological site and requested evidence of complete removal of remains (Stokes, July 14, 1992).

Cultural Resources Survey (US Navy, 1994)

In 1994, the Navy completed the *Cultural Resources Survey For Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York, Brooklyn, NY*, an intensive-level cultural resources survey of the NAVSTA Brooklyn site in accordance with SHPO comments of 1992. Each building or structure was evaluated according to the Secretary of the Interior's Criteria for Historic Significance (36 CFR 60.4). The 1994 study provided additional information on properties that were located in the northern triangle, western industrial sector, and BQE frontage area of the NAVSTA Brooklyn site that were historically associated more with the Brooklyn Naval Shipyard than the Naval Hospital. The report also supplied additional information about the Naval Hospital campus, including the cemetery (see Subsection 3.8.3) (US Navy, 1994).

Brooklyn Navy Yard

The 1994 *Cultural Resource Survey* distinguishes elements of NAVSTA Brooklyn as being associated with the main shipyard or with the Naval Hospital, identifying them as two separate National Register-eligible historic districts, to which the SHPO concurred (Gillespie, November 18, 1994). The majority of the buildings in the northern triangle, western industrial sector, and BQE frontage area of NAVSTA Brooklyn are linked to the WW II expansion of the Brooklyn Navy Yard. The survey report concluded that much of the former Naval shipyard (outside of NAVSTA Brooklyn) appeared eligible for listing in the National Register as the Former Brooklyn Navy Yard

Historic District. Under 36 CFR 60.4, the district would be eligible under Criterion A for its long history of important contributions to Naval and maritime history from the early 19th century through World War II. It would also be eligible under Criterion C as an important collection of functionally related buildings that have survived for nearly 150 years. Structures within the northern triangle, western industrial sector, and BQE frontage area of NAVSTA Brooklyn would contribute to this potential district because they are an intact collection of buildings that retain historic and architectural integrity as maritime and industrial buildings (US Navy, 1994). The contributing and non-contributing resources to the Former Brooklyn Navy Yard Historic District are presented in Table 3.8-2 and Figure 3.8-2; no boundaries of this district were identified in the 1994 survey or by the SHPO.

Naval Hospital Campus

The *Cultural Resources Survey* (US Navy, 1994) provided further information about the Naval Hospital district (determined eligible for the National Register in 1992 under Criteria A and C), and also reevaluated the district's contributing and non-contributing resources.

The *Cultural Resources Survey* emphasized that the district constitutes a historically significant collection of 19th and 20th century residential, industrial, and institutional buildings associated with the establishment and development of one of the nation's oldest Naval installations (US Navy, 1994). The hospital campus buildings form a coherent group interspersed with mature trees and other landscape features, and encircled by a historic, brick perimeter wall boundary. The 1994 report also recommended that the Memorial Area site, perimeter wall structure, and garage (Bldg R103A) contribute to the significance of the hospital district, while the bath house (Bldg 672) and pool (Bldg 671) were non-contributing (US Navy 1994) (Figure 3.8-2). In 1994, the SHPO concurred with these recommendations. Table 3.8-3 summarizes the contributing and non-contributing resources in the Naval Hospital Historic District; no boundaries of this district were identified in the 1994 survey or by the SHPO.

A field view conducted in June 1998 revealed that the glass-and-frame superstructure of the greenhouse (Bldg R448), which was deteriorating at the time of the 1994 survey, no longer exists, but that the concrete foundation remains.

3.8.3 Phase 1 Intensive Archaeological Survey

The Navy has undertaken a series of five work efforts in order to assess NAVSTA Brooklyn's archaeological resources. The first three required documentary analysis, as summarized below. The second two required subsurface testing, as summarized in Subchapter 3.8.4.

Table 3.8-2

Contributing and Non-Contributing Resources to Former Brooklyn Navy Yard Historic District

Navy Building Number	Historic Building Name	Location at NAVSTA Brooklyn	Contributing Resource	Non-Contributing Resource
1	Materials Testing Laboratory	Western Industrial Sector	✓	
2	Foundry	Western Industrial Sector	✓	
3	Gate and Guard House	Western Industrial Sector		✓
5	Central Bank	Western Industrial Sector	✓	
7	Substation	Western Industrial Sector	✓	
8	Substation and Transformer	Western Industrial Sector		✓
10	Public Works Storage Bin	Western Industrial Sector		✓
No number	Main Gate	Western Industrial Sector		✓
305	Stables	Northern Triangle	✓	
306	Storage and Operations	Northern Triangle		✓
311	Motion Picture Exchange	BQE Frontage	✓	
316	Transportation Maintenance (316)	Northern Triangle		✓
353	Storage	Northern Triangle		✓
Source:	Table 5-1 in *Cultural Resources Survey For Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York, Brooklyn, NY* (US Navy, 1994)			

Table 3.8-3

Contributing and Non-Contributing Resources to Naval Hospital Historic District

Navy Building Number	Historic Building Name	Location at NAVSTA Brooklyn	Contributing Resource	Non-Contributing Resource
RD	Laboratory	BQE Frontage	✓	
RG	Nurses' Quarters	Hospital Campus	✓	
R1	Surgeon's House	Hospital Campus	✓	
R2	Quarters	Hospital Campus	✓	
R3	Quarters	Hospital Campus	✓	
R4	Director of Laboratory Quarters	Hospital Campus	✓	
R5	Contagious Disease Unit A	Hospital Campus	✓	
R6	Contagious Disease Unit B	Hospital Campus	✓	
R7	Contagious Disease Unit C	Hospital Campus	✓	
R8	Bachelor Officers' Quarters	Hospital Campus	✓	
R9	Bachelor Officers' Quarters	Hospital Campus	✓	
R95	US Naval Hospital	Hospital Campus	✓	
R103	Carriage House	Hospital Campus	✓	
R103A	Garage	Hospital Campus	✓	
R104	Guard House and Gate Keeper Lodge	Hospital Campus	✓	
R109	Stable	Hospital Campus	✓	
R426	Mortuary	BQE Frontage	✓	
R448	Greenhouse	Hospital Campus	✓	
R450	NE Substation	Hospital Campus	✓	
R475	Gas Station	Hospital Campus		✓
R476	Hewes Street Gatehouse	Hospital Campus		✓
671	Pool	Hospital Campus		✓
672	Bath House*	Hospital Campus		✓
No number	Gazebo	Hospital Campus		✓
No number	Memorial Area*	Hospital Campus	✓	
No number	Perimeter Wall*	Hospital Campus	✓	

Notes: *Not evaluated by SHPO in 1992.
Source: *Cultural Resources Survey For Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York, Brooklyn, NY* (US Navy, 1994).

***Cultural Resources Survey for Base Closure and Realignment, Redevelopment and Reuse of Excess Property at Naval Station New York* (US Navy, 1994)**

Conducted as a follow-up to the Cultural Resources Appendix of the *Environmental Assessment for Base Closure and Realignment of Naval Station New York at Brooklyn* (US Navy, 1990), this documentary survey provided preliminary consideration of the station's architectural and archaeological resources. The report included background research, walkover inspection, disturbance assessment, and an evaluation of the site's cultural resource sensitivity.

Background research for the archaeological resources survey was based on a review of files at the NY SHPO, the NYS Museum (NYSM) Historical and Anthropological Surveys, and the NYC Landmarks Preservation Commission (Landmarks), and on the published cultural resource surveys of nearby projects. In summary:

- **Prehistoric sites:** No prehistoric sites have been documented within NAVSTA Brooklyn. However, NYSM files indicated that four prehistoric sites, recorded by avocational archaeologists, have been identified in the vicinity of the site. Based on (1) the terrain of the site, which is similar to terrain in the general vicinity where recorded archaeological sites were found; and (2) the physiographic characteristics of the location, which suggest a high probability of prehistoric occupation or use (US Navy, 1994), the NYSM ranked the former Brooklyn Navy Yard as exhibiting a high probability of producing prehistoric archaeological data.

- **Historic sites:** Six historic period sites have been identified in the vicinity of the site: four in Brooklyn (three in the area of the Brooklyn and Manhattan Bridges [a 19th-century store site, an 18th-century tavern foundation, and 17th-century dock remains], and a 19th-century domestic site on Dean Street, approximately 1.24 mi [two km] southwest of NAVSTA Brooklyn); one in Queens (the remains of a historic house); and one in Manhattan (an early 19th-century suburb) (US Navy, 1994).

  Four locations in the western portion of the former Navy Yard, west of the NAVSTA Brooklyn site, and along a segment of Hudson Avenue were found to have the potential to contain prehistoric and historic resources (US Navy, 1993) related to:

  - Native American occupation;
  - Burial of Revolutionary War prisoners on the western shore of Wallabout Bay;
  - Interment of remains of Revolutionary War prisoners at the Monument Lot, located west of the Navy Yard; and
  - Intact portions of an 1890s dry dock.

In addition, a historic railroad-car transfer bridge in the Navy Yard was recommended eligible for listing in the National Register of Historic Places (US Navy, 1994).

Based solely on background research and a surface reconnaissance, areas of high, moderate, and low archaeological sensitivity were identified within the NAVSTA Brooklyn site (US Navy, 1994). The Naval Hospital Cemetery was ranked as having a low sensitivity because it appeared that the major landscape modifications of the 1930s and 1940s had significantly disturbed any remains not removed in 1926.

In 1994, the SHPO reviewed this report and did not concur with the archaeological sensitivity recommendations; however, at that time and in the absence of specific future development plans, they reserved recommendations as to the need for further archaeological investigation.

In 1996, public meetings were held by the City of New York to determine the future use of NAVSTA Brooklyn. At these meetings, concerns were raised by local citizens about the potential presence of a burial ground similar to the African-American burial ground identified in Manhattan in 1991. In response to these concerns, the Navy conducted additional documentary research efforts that are summarized below.

Archaeological Evaluation (Stage 1A Documentary Study) Naval Station (NAVSTA) New York Navy Yard Annex Site **(US Navy, 1997a)**

This report had three specific goals:

- To reassess the archaeological potential of NAVSTA Brooklyn;
- To determine the potential for military graves to remain in the cemetery despite the removal of burials in 1926; and
- To assess the potential for the site to contain an African-American burial ground.

Through consideration of previously unavailable primary sources, the 1997 *Archaeological Evaluation* addressed each of these goals.

The study identified five areas of archaeological potential. Two of these areas were identified as having a moderate to low potential for prehistoric resources, and three were identified as having a high sensitivity for historic resources. The two areas sensitive for prehistoric resources were an undeveloped grassy area southeast of the hospital and an undeveloped area in the vicinity of a tennis court west of the Nurses' Quarters (Bldg RG).

The areas considered sensitive for historic resources consisted of two paved areas immediately adjacent to the Naval Hospital, and the Hospital cemetery. Each of these areas was assessed through subsurface testing in a subsequent field effort, which determined that the two areas identified as having a low to moderate sensitivity for prehistoric resources actually possess no such sensitivity. The results of subsurface testing of the areas sensitive for historic resources are summarized in Subchapter 3.8.4.

The 1997 research identified discrepancies between the number of individuals reported to have been buried in the Naval Hospital Cemetery and the number of individuals reported to have been disinterred in 1926 (US Navy, 1997a). This discrepancy revealed the possibility that all of the human remains originally interred in the cemetery may not have been removed in 1926.

Research also revealed that Naval personnel who died between 1834 and 1862 were mainly white, and an examination of burial records suggested that roughly ten percent of the burial population were African-American (US Navy, 1997a). No documentation was found to substantiate comments made during the scoping that an early African-American burial ground existed on the Naval Hospital site, nor of any burial ground predating the one associated with the Naval Hospital.

In early 1997, the SHPO and Landmarks approved the 1997 *Archaeological Evaluation* report and concurred with its recommendations.

***State of the Research, Naval Hospital Cemetery NAVSTA Brooklyn Historical Documentation* (US Navy, 1998a)**

Having identified the possibility that all of the human remains originally interred at the cemetery may not have been removed in 1926, the Navy conducted additional documentary research in order to more fully understand the nature and magnitude of the issues surrounding the cemetery. The primary goals of the resulting report (US Navy, 1998a) were to determine, if possible, the number, name, rank, and other information on unaccounted-for burials and why these bodies remain undocumented.

This research effort determined that due to such factors as record-keeping problems, vandalism, and the deterioration of the original wooden grave markers, there are over 500 individuals not documented as having been disinterred from the Naval Hospital Cemetery (US Navy, 1998a).

3.8.4 Archaeological Subsurface Testing

***Ground-Penetrating Radar Evaluation, Navy-Retained Section (former) Brooklyn Navy Yard* (US Navy, 1997b)**

To follow up the 1997 Stage 1A Documentary Study, an evaluation was conducted in July 1997 in the cemetery to determine if ground-penetrating radar (GPR) technology was suitable to identify potentially intact human remains. Four linear GPR transects were surveyed across the hypothesized extent of the cemetery. Examination of the GPR readings led to the identification of five areas with subsurface anomalies. To investigate these anomalous areas, five trenches were excavated with a small backhoe. Excavation of one of these trenches led to the discovery of portions of a human skeleton buried at a shallow depth. Filled shaft features, small quantities of fragmentary human bone, and some evidence of decayed coffins were recovered in the four remaining trenches. The groundproofing procedures proved that while GPR is capable of locating possibly intact skeletons and shaft features, it cannot necessarily distinguish between the two. Groundproofing also established that burials may be closer to the ground surface than previously thought.

In 1998, the SHPO reviewed the GPR evaluation (US Navy, 1997b) and determined that the Naval Hospital Cemetery site is eligible for listing in the National Register as a contributing component to the Naval Hospital Historic District (Kuhn, January 7, 1998).

***Archaeological Evaluation (Phase 2 Study) Former US Naval Hospital Archaeological Features* (US Navy, 1998b)**

Subsurface testing was conducted in September 1998 to determine if National Register-eligible resources were present beneath the paved area to the south of the Naval Hospital and within the hospital's courtyard to the east. This effort identified several historic features in the hospital courtyard: two cisterns, a brick drainage line, a cesspool, and several brick foundation walls. The report (US Navy, 1998b) concluded that these features are contributing components to the Naval Hospital (which is a NYC landmark) and are, therefore, National Register-eligible. This report also concluded that similar features are likely present in areas within a 20-ft (six-m) radius of the hospital to the south, west, north, and east (Figure 3.8-2).

3.9 Natural Resources

3.9.1 Biological Resources

As NAVSTA Brooklyn is in an urban environment, much of the site has been filled and paved for industrial uses. As a result of this intensive level of development, there is insufficient natural habitat to support most wildlife species. Open space remaining at NAVSTA Brooklyn is characterized by ornamental trees adjacent to roadways, maintained grass lawns, and ballfields. Along the fence line surrounding the base, and along an interior fence around an existing tennis court, small swaths of early successional vegetation are present. These swaths measure approximately 15 ft (five m) in width (Ecology and Environment, Inc., 1989).

There are no records indicating the presence of any federal- or state-listed endangered or threatened species at the NAVSTA Brooklyn site (Natural Heritage Program, 1998).

3.9.2 Wetlands and Floodplains

Based upon review of National Wetland Inventory (NWI) mapping (Brooklyn quadrangle) and previous site investigation reports, no wetlands occur at NAVSTA Brooklyn. With respect to floodplains, the pertinent National Flood Insurance Program's Flood Insurance Rate Map (FIRM) was consulted (Community-Panel Number 360497 0055 B, City of New York, November 16, 1983). There is an approximately one-acre (0.5-hectare) area in the northeast portion of the site that is classified as Zone B. Zone B is defined by the FIRM as "areas between the limits of the 100-year flood and the 500 year flood; or certain areas subject to 100-year-flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile: or areas protected by levees from the base flood."

3.9.3 Water Resources

Surface Water

There are no streams, creeks, ponds, or lakes located on the NAVSTA Brooklyn site. The site is, however, less than 1,000 ft (305 m) from the East River. The East River is a tidal strait that connects the western portion of Long Island Sound to New York Harbor. Both New York Harbor and the Long Island Sound open to meet the Atlantic Ocean.

Groundwater

The borough of Brooklyn is located in the westerly portion of Long Island. The aquifer system of Long Island is comprised of three aquifers which are continuous throughout most of Long Island, except on the north shore and parts of the western end. NAVSTA Brooklyn is not located on the aquifer system of Long Island, and does not use that system to obtain potable water. As described in Subchapter 3.7, potable water is supplied to the site via the City of New York, which draws its water from reservoirs located in upstate New York.

3.9.4 Topography, Geology, and Soils

The borough of Brooklyn is located in the Atlantic Coastal Plain physiographic province, which is characterized by very flat topography. The bedrock units of Long Island consist mainly of the Raritan and Magothy formations of the Upper Cretaceous Period. These formations are coastal plain deposits comprised of gravel, sand, and silt. In the vicinity of NAVSTA Brooklyn, the bedrock consists of shale, limestone, dolostone, and metamorphic rocks of the New York City Group.

Prior to development of the Brooklyn Naval Shipyard and NAVSTA Brooklyn, the site area consisted of a tidal flat and marsh. Soils at that time were organically rich silts and clays, with some sand or gravel associated with shallow tidal channels (Ecology and Environment, Inc., 1989). Since construction of the shipyard and its associated developments, extensive filling has taken place. It is estimated that the top six ft (two m) of soil at the site are extensively comprised of fill materials (Tunstead, 1998).

3.10 Petroleum and Hazardous Substances

This subchapter addresses petroleum and hazardous substances as they relate to the closure and ultimate disposal of NAVSTA Brooklyn, and is organized as follows:

- Subchapter 3.10.1 describes the environmental compliance activities that have been undertaken at NAVSTA Brooklyn;
- Subchapter 3.10.2 discusses the Environmental Baseline Survey (EBS) and associated remediation measures; and
- Subchapter 3.10.3 describes the environmental condition of NAVSTA Brooklyn as it relates to reuse of the property.

The purpose of this subchapter is to summarize the current status of the environmental restoration and compliance activities at the base, and to describe the environmental conditions and suitability to transfer of Naval properties.

However, it is important for the reader to understand that the site remediation process is occurring parallel to the NEPA process and has its own set of standards, procedures, and guidelines. It is a process that will proceed to its logical conclusion independently of the NEPA process (i.e., cleanup of the site to a level necessary for property disposal, which is reflective of the proposed or planned possible reuses). Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Navy is committed to:

- Identifying the type and quantity of the release of hazardous substances on-site; and
- Completing a remedial action that is successful (as determined by USEPA and NYSDEC) such that the property is suitable for transfer.

As a result of past waste and resource management practices at NAVSTA Brooklyn, some areas have been impacted by various hazardous materials and wastes. While no Installation Restoration Program (IRP) sites have been designated at NAVSTA Brooklyn, portions of the site were identified by the NYSDEC as confirmed inactive hazardous waste disposal sites subject to the State of New York Superfund Program (BRAC Cleanup Team et al., February 1996). Subsequent investigations and remediation (see Subchapter 3.10.2) resulted in the NYSDEC delisting these portions of NAVSTA Brooklyn as inactive hazardous waste sites in December 1997.

Information contained in this subchapter is based largely upon the following documents:.

- *Environmental Baseline Survey Phase II Review Item Screening Matrix Naval Station-New York Sites (Fort Wadsworth, Floyd Bennett Field, Stapleton Homeport, Front Street Properties, and Brooklyn Naval Station)* (EA Engineering, Science, and Technology [EA Engineering], November 1994);

- *Environmental Baseline Survey Phase II Summary Report, Naval Station-New York, Volume 1 of 2* (EA Engineering, December 1995);

- *Close-Out Report for Closures/Removals/Remediations at Naval Station New York* (Foster Wheeler Environmental Corporation [Foster Wheeler], January 1996); and

- *Base Realignment and Closure Cleanup Plan (BCP) for Naval Station Staten Island and Brooklyn, NY* (BRAC Cleanup Team et al., February 1996).

3.10.1 Compliance Program Status

Compliance activities at NAVSTA Brooklyn are related to underground storage tanks (USTs), lead-based paint (LBP), polychlorinated biphenyls (PCBs), and asbestos.

Underground Storage Tanks

The USEPA has delegated the management of USTs at NAVSTA Brooklyn to the NYSDEC. A project to remove inactive or out-of-compliance tanks was completed in 1994 (BRAC Cleanup Team et al., February 1996), resulting in the removal of 12 USTs and the abandonment, in place, of five clean USTs. The USTs had been used to store gasoline, fuel oil, and diesel.

Lead-Based Paint

An LBP survey was conducted at the residential units. Department of Defense (DoD) policy is to comply with all applicable federal, state, and local laws and regulations governing LBP (US Navy, October 31, 1994; US Navy, 1998). Regulations are targeted at residential structures/dwellings, as persons are more likely to receive exposure in residences than in non-residential structures. Abatement of LBP hazards identified in such units began in 1995 and was completed in 1996 (BRAC Cleanup Team et al., February 1996; Felton, February 27, 1998).

Polychlorinated Biphenyls

Three 25-kilovolt (KVA) and one 250-KVA transformer were removed in 1993 (BRAC Cleanup Team et al., February 1996). Two 4,500-KVA transformers were retrofilled in 1994 and one 250-KVA transformer was retrofilled in 1989. There are currently no PCB or PCB-contaminated

transformers at NAVSTA Brooklyn (BRAC Cleanup Team et al., February 1996). Excavation and disposal of PCB-contaminated soil near Bldgs 7, 8, and 305 was completed in 1995.

Asbestos

Asbestos-containing materials are regulated by the USEPA and NYSDEC. Asbestos surveys have been conducted at both residential and non-residential areas of NAVSTA Brooklyn (Felton, February 27, 1998). Abatement of friable, accessible, and damaged (FAD) asbestos at NAVSTA Brooklyn began in 1994 and was completed in 1995 in the non-residential areas and in 1996 in the residential areas. Another hazardous materials study is underway to determine if any further deterioration of asbestos has occurred at the facility (Felton, June 21, 1999).

3.10.2 Environmental Baseline Survey

3.10.2.1 Environmental Baseline Survey Phase I

The purpose of the Environmental Baseline Survey (EBS) Phase I, conducted in the fall of 1993, was to assess and document the environmental condition of the NAVSTA New York property, including NAVSTA Brooklyn.

During the EBS Phase I investigation, nine locations, or "review items," were identified at NAVSTA Brooklyn as requiring additional information to determine if a release or disposal had occurred. One of the review items, the "Less than 90-Day Satellite Accumulation Site," was eliminated from the evaluation because it was investigated under a separate closure report and was ultimately closed in 1994. To determine which review items would be included in the EBS Phase II Work Plan, a screening matrix was developed that placed each item into one of the following four classifications:

- No Further Action;
- Confirmatory Action (specifically to confirm that constituents of concern are not present at concentrations of concern);
- Full Sampling (to fully characterize potential constituents at a particular review item); and
- Other Action (review items for which an interim or final corrective action would be more appropriate than sampling, review items that are already included in another regulatory program, or review items that require further research before categorization).

The classifications for the EBS Phase II review items at NAVSTA Brooklyn are summarized in Table 3.10-1. Two of the review items (Bldg 306 and Bldgs R103/R109) were classified as requiring confirmatory sampling and were included in the EBS Phase II Work Plan.

Environmental Baseline Survey Phase II

The objectives of the EBS Phase II were to conduct confirmatory sampling for Bldg 306 and Bldgs R103/R109, compare the analytical sample results to New York State regulatory requirements, and recommend the appropriate alternative (e.g., take no action, perform remedial action, conduct additional investigation).

Bldg 306 - Former Boat Repair Facility

Building 306 is a single-story building formerly used for boat repair and storage. The EBS Phase II inspection identified two locations in the building for confirmatory sampling (EA Engineering, December 1995). Five soil samples, one groundwater sample, and one chip sample from the brick floor were collected and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and priority pollutant metals.

Some SVOCs and metals were detected at concentrations above NYSDEC Technical and Administrative Guidance Memorandum (TAGM) soil cleanup objectives (NYSDEC, 1994). Elevated concentrations of SVOCs were detected in the lubrication dispenser area, indicating that past activities may have affected soil quality. In contrast, metals concentrations did not indicate a significant impact associated with past activities (EA Engineering, December 1995). Because the contaminated soil was found inside of Bldg 306 and below the existing floor, further consideration and possible further action were recommended (EA Engineering, December 1995).

The groundwater sample taken detected five metals (beryllium, chromium, lead, copper, and nickel) at concentrations exceeding groundwater guidance values. However, the elevated concentrations may result from taking a Direct-Push groundwater sample, which has a high concentration of suspended soils associated with it. It is likely that metals present in the soil adsorbed onto suspended soils in the groundwater, resulting in elevated metals concentrations (EA Engineering, December 1995).

Table 3.10-1

EBS Phase II Review Items at NAVSTA Brooklyn

Review Item	Description/ Past Waste Management	Classification			
		1	2	3	4
Bldgs 305 and 316	Former storage facilities; minor stains and no drains observed.	✓			
Bldg 306	Former boat repair and storage facility/ maintenance pit/oil and lube dispenser; no drains; concrete and bricked floors; minor staining.		✓		
Bldg 3	Security outpost; no observed or reported waste storage, release, or disposal.	✓			
Bldg 311	Naval Motion Pictures Service Site: not used for film stripping operation.	✓			
Bldg R95	Naval Hospital; structurally unsound; no evidence of hazardous material storage.				✓
Bldg R475	Gas station/auto body shop; former tanks removed; contaminated soil pile removed.	✓			
Bldgs R1-R9 and RG	Former housing units and Officer's Club; flaking paint.				✓
Bldgs R103 and R109	Former garage and storage facility; flaking paint, mechanics pit and sump.		✓		✓

Notes: Classification 1 = No Further Action
Classification 2 = Confirmatory Sampling
Classification 3 = Full Sampling
Classification 4 = Other Action was completed as follows:
Bldg 95 – Asbestos abatement was completed. Building was structurally secured during abatement.
Bldgs R1-R9 and RG – Surficial soil sampling and soil removal and interim controls for soil impacted by lead-based paint was completed in 1996.
Bldg R103 and R109 – Confirmatory sampling within and below the mechanics' pit and sump of R109 was completed, and remediation was completed.

Source: EA Engineering, November 1994; Felton, February 27, 1998.

As a result of the EBS Phase II, Foster Wheeler was contracted by the Navy to perform removal/remedial measures. Measures included excavation and disposal of soil and debris from Bldg 306 and collecting associated confirmatory and waste disposal samples. A total of 9.2 tons (8.3 metric tons) of impacted soil was excavated from under the lubrication dispension area in Bldg 306. Confirmatory samples collected from the excavation area prior to backfilling indicated that soil contaminants were below New York State regulatory requirements, thereby permitting the soil to be disposed of as non-regulated soil. The excavation was backfilled with certified clean fill (Foster Wheeler, January 1996).

Bldgs R103/R109 – Sump Pit

Soil and chip samples were collected and analyzed from Bldgs R103/R109, the former garage and storage facility. Elevated concentrations of metals, in particular lead, were reported from locations below the maintenance pit in Bldg R103. Since past activities at Bldg R103 had apparently affected soil quality below the sump, further consideration and possible further action were recommended for Bldgs R103/ R109 (EA Engineering, December 1995).

Soil borings were taken at Bldg R103 and analyzed to determine the extent of lead contamination from the sump (Foster Wheeler, January 1996). Elevated concentrations of lead were found in the samples; however, the lead was associated with fill material used at Bldg R103, rather than the sump. The fill material was not excavated, but was covered with six to ten in (15 to 25 cm) of clean fill, which was seeded with grass to further reduce the possibility of exposure to the contaminated fill (Felton, February 17, 1998).

During the investigations at Bldg R109, a 55-gallon (208-liter) drum that had been used for disposal of old petroleum products was discovered. The drum and all surrounding contaminated soil were removed from the site in early 1997 and no further action is recommended (Felton, February 27, 1998).

Table 3.10-2

Environmental Baseline Survey Categories

Category	Definition
1	Areas where no release or disposal (including migration) has occurred
2	Areas where only release or storage of petroleum products has occurred
3	Areas of contamination where release, disposal, or migration of hazardous substances has occurred but remedial action is not required
4	Areas where all remedial action has been taken
5	Areas of known contamination with removal and/or remedial action underway but not completed
6	Areas of known contamination where required response actions have not yet been implemented
7	Areas that are unevaluated or that require further evaluation
Source: BRAC Cleanup Team et al., 1996	

4 IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

Chapter 4 is organized in a manner similar to Chapter 3. Subchapters 4.1 through 4.10 address environmental impacts at NAVSTA Brooklyn and the surrounding area of Kings County (Brooklyn) as related to the implementation of five alternatives: no action, Reuse Plan, residential, museum, and as-of-right. Subchapter 4.11 addresses cumulative impacts of the disposal and reuse of NAVSTA Brooklyn and any other pertinent projects.

As a long-range planning tool for the redevelopment of NAVSTA Brooklyn, the Reuse Plan presents overall development goals and objectives, particularly with respect to general types of development (e.g., industrial versus institutional) and the acreage and/or floor area allocated to each broad category of land use. However, the specific users remain uncertain and much will depend upon emerging opportunities and community needs. This situation has necessitated two levels of project impact analysis: quantitative and qualitative.

Quantitative analyses were conducted wherever possible for those aspects of the proposed Reuse Plan that are essentially a function of the number of employees and/or square feet of development. For example, regional employment impacts, intersection analyses of future traffic, motor vehicle-related air and noise impacts, and sanitary wastewater loads are discussed quantitatively.

Qualitative analyses were conducted for those proposed Reuse Plan components that cannot be specified at this time. For example, specific building renovations and community facility type have not yet been developed and specific related impacts can only be discussed qualitatively. Similarly, although sanitary wastewater loads can be quantified at this time, industrial wastewater loads and air emissions cannot, since the specific type and requirements of such future uses are unknown. However, the qualitative analyses presented do identify sensitive environmental issues that need to be addressed and describe the types of permits (and their requirements) that must be obtained.

4.1 Land Use, Zoning, Public Policy, and Neighborhood Character

4.1.1 No Action Alternative

Under No Action Alternative conditions, NAVSTA Brooklyn would be closed in accordance with *Base Realignment and Closure Facility Layaway and Caretaker Maintenance Standards* (US Navy, 1994). This action would not be consistent with existing land uses in Brooklyn and Community District (CD) 2, nor with existing public policies, particularly as represented in the Local Waterfront Revitalization Program (NYCDCP, 1994). Continued abandonment of NAVSTA Brooklyn could

be a blighting influence on the surrounding area and represent a lost opportunity to achieve economic development, community facility, and cultural resource goals for the community.

4.1.2 Reuse Plan

Land Use

Implementation of the Reuse Plan would result in the continued use and further development of the site for general light industrial, business, and office uses in the northern triangle and the western industrial sector, commercial uses on the BQE frontage (southeast corner), and institutional and community facility uses on the hospital campus portion of the base. Figure 2-2 in Chapter 2 shows the allocation of the proposed uses superimposed on a plan of the existing base. No new construction is proposed, only the adaptive reuse of existing buildings, although some demolition of minor structures may be appropriate (e.g., tennis courts, greenhouse, and service station).

The proposed land use elements would be accessed from the existing city street network of Flushing Avenue, Williamsburg Street West, and Kent Avenue, and from the internal road system of the Brooklyn Navy Yard for the industrial areas. The two areas (northern triangle and western industrial sector) proposed for light industrial uses would be integrated with the rest of the BNYDC-controlled former Navy Yard. The BNYDC is also likely to manage the commercial sector proposed for the BQE frontage area of the site. The two industrial areas would be likely to retain the secure access characteristics associated with the rest of the Navy Yard.

It is assumed that NAVSTA Brooklyn's former main gate on Flushing Avenue at Washington Avenue would serve the western industrial sector, and that the controlled-access road from Kent Avenue at Clymer Street would serve the northern triangle. The institutional campus would be accessed from the old hospital gate on Flushing Avenue, between Grand Avenue and Ryerson Street, and from a former gate at the intersection of Kent Avenue and Williamsburg Street West at Hewes Street. The Reuse Plan is not specific as to what extent access to the campus, cemetery memorial area, and recreational space would in any way be controlled, nor in the means to achieve controlled access. It is assumed here that the perimeter would be fenced and that the NYC Department of Parks and Recreation would close gates according to their normal daylight schedules.

In general land use terms, the reuse of existing industrial facilities would be consistent with their past use and with the surrounding land uses. Similarly, the proposed reuse of the hospital campus for community facility/institutional purposes is broadly consistent with historic uses, although the former military quarters would no longer be residential. While the development of commercial uses at the BQE frontage area would represent a new use, the proposed commercial uses would be appropriate for this busy traffic node that serves the adjacent industrial and residential areas. The proposed uses of the Reuse Plan would represent a more intensive utilization of the site than under

the No Action Alternative but would be compatible with the surrounding community and create no significantly adverse land use impacts.

Zoning

Zoning and land use policy for NAVSTA Brooklyn has reflected its status as an annex to the heavy industrial activities of the former Navy Yard (zoned M3-1), rather than its institutional and residential functions. City zoning does not govern its status as federal property.

The Reuse Plan proposes to rezone the entire NAVSTA Brooklyn site to C8, a commercial designation that permits a wide variety of commercial uses, light industry, and non-residential community facilities, but no residential development. The use groups designated in the NYC Zoning Resolution as permitted in C8 districts include the following:

- Use Group 4 – includes community centers, health centers and medical offices, hospitals, welfare centers, and non-profit institutions (Use Group 3 community facilities, including colleges, museums, and nursing homes, are not permitted in C8 districts);
- Use Group 5 – includes transient accommodations (i.e., hotels);
- Use Group 6 – includes a wide variety of retail, offices, and public services;
- Use Group 7 – includes additional retail, wholesale, and auto service;
- Use Group 8 – includes theaters, additional retail, and public services;
- Use Group 9 – includes additional retail and business services;
- Use Group 10 – includes large retail (i.e., department stores);
- Use Group 11 – includes a variety of custom manufacturing;
- Use Group 12 – includes fairly large entertainment facilities (e.g., arenas seating up to 2,500);
- Use Group 13 – includes open or enclosed amusement parks, and catering establishments;
- Use Group 14 – includes a variety of boat-oriented sales and services; and
- Use Group 16 – includes a variety of auto services, trucking terminals, and vehicle storage.

The Reuse Plan does not identify which of the four sub-designations of C8 the site would be rezoned to. These sub-designations affect the permitted bulk and FARs as shown in Table 4.1-1, and have varying parking requirements; generally, C8-1 to C8-3 districts require substantial parking, and C8-4 districts are exempt from parking requirements. A C8-3 designation is expected for the site (Fishman, September 2, 1998).

Table 4.1-1

C8 Zoning

Zoning	Maximum Floor Area Ratio	
	Commercial Buildings	Community Facility Buildings
C8-1	1.00	2.40
C8-2	2.00	4.80
C8-3	2.00	6.50
C8-4	5.00	6.50

Implementation of the Reuse Plan would not entail new construction; rather, it involves the adaptive reuse of existing structures. Table 2-2 lays out the land use program associated with the Reuse Plan. A total of 460,000 sq ft (43,400 sq m) of industrial space would be developed in existing buildings; 52,500 sq ft (4,900 sq m) of commercial space in existing buildings at the BQE frontage; and 180,500 sq ft (16,800 sq m) of institutional space in the hospital campus portion of the facility.

In addition, about ten acres (four hectares) of open space would be available for recreation, as well as about 1.7 acres (0.68 hectares) of open space dedicated as a restoration of the Hospital Cemetery. Parking for an estimated 800 vehicles would be provided. Because specific users of the institutional space have not been identified at this time, the amount of parking that would be required cannot be exactly determined. If additional parking is required, it would most likely be at the expense of unpaved areas presently intended for recreation.

Public Policy

The NAVSTA Brooklyn site is located within the coastal zone boundary of New York City. As noted in Subchapter 3.1.3, the Local Waterfront Revitalization Program (LWRP) includes a set of 56 policy statements (44 state and 12 city policies) that address the waterfront's important resources; the 56 policies are provided as Appendix F. Those that pertain and are applicable to the Reuse Plan are addressed in Table 4.1-2.

With respect to the types of waterfront environments identified in the New York City Comprehensive Waterfront Plan (NYCDCP, 1992), the following evaluations can be made:

- **Natural Waterfront**: Because of the extensive reclamation, use of fill, bulkheading along the shoreline, and the long history of industrial use, the environment of the site

Table 4.1-2

LWRP Policies Applicable to Reuse Plan Land Uses

Policy	Response
Policy 2: Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.	Although within the coastal zone, the NAVSTA Brooklyn site is not on the East River waterfront and the Reuse Plan does not call for any water-dependent uses. However, portions of the former Brooklyn Navy Yard occupy the waterfront area where there are three existing water-dependent uses: a concrete batching plant and two ship repair facilities (City of New York, 1994). Industrial reuse of the buildings in the northern triangle and western industrial sector would support BNYDC activities but specific users/tenants are unknown at this time.
Policy 4: Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity.	The Reuse Plan encourages the development of the NAVSTA Brooklyn site, which is situated in one of the major ports of New York, through the adaptive reuse of the existing buildings that contributed to the unique identity of the former Brooklyn Navy Yard. The NAVSTA Brooklyn site includes two NYC-landmarked buildings (the Naval Hospital and the Surgeon's House) and has been determined eligible for the National Register by the NY SHPO.
Policy 5: Encourage the location of development in areas where public services and facilities essential to such development are adequate.	The requisite infrastructure is available and adequate to begin implementation of the proposed action.
Policy 11: Buildings and other structures will be sited on the coastal area so as to minimize damage to property and the endangering of human lives by flooding and erosion.	About one acre (0.4 hectare) of the 28.8-acre (11.7-hectare) site is located in Zone B as depicted on the Flood Insurance Rate Map (FIRM) for the City of New York (Community Panel Number 360497 0555B). There are four existing warehouse-type buildings situated in Zone B (or partly so) in the northern triangle, none to be used for residential purposes. Zone B is defined as the area "between the limits of the 100-year flood and the 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood." Given the long-standing presence of these structures in their present location and the fact that they would not be used for residential purposes, there would be minimal potential endangerment of human lives by flooding or erosion.
Policy 18: To safeguard the vital interest of the State of New York and of its citizens in the waters and other valuable resources of the state's coastal area, all practicable steps shall be taken to ensure that such interests are accorded full consideration in the deliberations, decisions and actions of state and federal bodies with authority over those waters and resources.	The Reuse Plan was prepared by the Mayor's Office of Planning and Community Relations, acting as the Local Reuse Authority (LRA). The reuse planning process took place from 1992 to 1996. Numerous planning meetings and public information meetings were held prior to the official publication of the Reuse Plan on March 1, 1996. As part of the NEPA requirements for this EIS, two public scoping meetings were held on February 6, 1997 to identify significant or controversial issues related to the proposed action. Following publication of the Draft EIS, a public hearing will be held to obtain additional public comment. Subsequent to this, all public comment will be documented and responded to in the Final EIS.

Table 4.1-2, Continued

LWRP Policies Applicable to Reuse Plan Land Uses

Policy	Response
New York City Policy F: Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of: immobile user groups; and communities without adequate waterfront park space and/or facilities.	The proposed action would increase the level and types of access to the coastal zone. Approximately 18.3 acres (7.4 hectares) of the hospital campus portion of the site would be used for open space, recreational, and/or institutional/not-for-profit purposes. The Reuse Plan proposes a combination of passive and active recreational space. While no specific use of the buildings is yet identified, possible uses include a day-care center, health center, job training center, school, or institutional uses. The publicly accessible open space would be placed under the control of the NYC Department of Parks and Recreation.
Policy 23: Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation.	Refer to Policy 4.
Policy 30: Municipal, industrial and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state water quality standards.	As redevelopment proceeds a stormwater management plan and a set of Best Management Practices (BMPs) would be implemented to comply with all applicable state water quality standards.
Policy 39: The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface waters supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.	The Reuse Plan would comply with all applicable New York City and New York State requirements to protect ground and surface waters. There are no significant fish and wildlife habitats, recreation areas, important agricultural lands, and scenic resources that would be adversely affected.
Policy 41: Land use or development in the coastal area will not cause national or state air quality standards to be violated.	National or state air quality standards would not be violated with implementation of the proposed action (Subchapter 4.4).
Policy 43: Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.	The Reuse Plan would not result in the generation of significant amounts of acid rain precursors nor would it cause a violation of any national or state air quality standard.

and surrounding area has been heavily impacted and does not display natural waterfront characteristics;

- **Public Waterfront**: The historical industrial use of the waterfront as a Naval shipyard has restricted public access. However, the proposed Reuse Plan and its alternatives would provide at least some public access to the coastal zone, if not to the actual waterfront; and

- **Working Waterfront**: As part of the former Brooklyn Navy Yard, the NAVSTA Brooklyn site was designated part of a significant maritime and industrial area. However, since that designation, new guidance has been developed. As outlined in the *New Waterfront Revitalization Program: A Proposed 197a Plan* (NYCDCP, 1997), this significant maritime and industrial area's proposed boundary does not include the NAVSTA Brooklyn site (Woods, December 10, 1998). Therefore, the strategies proposed for these significant areas would not be applicable once the plan is officially approved.

- **Redeveloping Waterfront**: The NAVSTA Brooklyn site was designated "a significant maritime and industrial area" in the NYC Comprehensive Waterfront Plan; however (as noted above under "working waterfront"), new guidance has been developed as a Proposed 197a Plan (NYCDCP, 1997). The Reuse Plan reflects the multi-use potential of the redeveloped NAVSTA Brooklyn site.

With respect to the plan for the Brooklyn waterfront (NYCDCP, 1994), the NAVSTA Brooklyn site, and waterfront environments, the following evaluations can be made:

- **Public waterfront**: Public access is not specifically identified for the NAVSTA Brooklyn site in the Brooklyn waterfront plan; however, a potential greenway/bike route skirting the perimeter of the area to provide a link in a continuous public access way along or near the Brooklyn waterfront is depicted in Figure 14.12 of the plan (NYCDCP, 1994);

- **Working waterfront**: Like the NYC Comprehensive Waterfront Plan, the Brooklyn waterfront plan recommends designating the Navy Yard as a significant maritime and industrial area; zoning is recommended to remain as manufacturing. However, the Brooklyn waterfront plan also states that "the exact boundaries of the significant areas will be determined as part of the [Waterfront Revitalization Plan] WRP revision which will be adopted as a 197a plan after full public review"(NYCDCP, 1997). This plan excludes the NAVSTA Brooklyn site from the boundaries of the significant maritime and industrial area.

The Reuse Plan is consistent with the goals of the LWRP, with the *New York City Comprehensive Waterfront Plan, Reclaiming the Water's Edge* (NYCDCP, 1992), the *Plan for the Brooklyn Waterfront* (NYCDCP, 1994), and the *New Waterfront Revitalization Program: A Proposed 197a Plan* (NYCDCP, 1997).

Other Public Policy

The Reuse Plan would have no effect on the nearby Williamsburg I Urban Renewal Area.

Neighborhood Character

The Reuse Plan would not cause adverse effects to the neighborhood's character. Reuse of former industrial buildings in the site's western industrial sector and northern triangle would mean the return of industrial and other employment opportunities, lost since the disposal of the Navy Yard in 1966. A total of 1,630 jobs are projected under the Reuse Plan. The hospital campus area would be used for institutional and recreational uses and would thus not only reflect past Navy uses of these buildings but provide a major new asset to the community. Although no institutional users are specified in the Reuse Plan, it states the following possibilities: a day-care center, a health center, a job-training center, a school, or institutional offices. Under the Reuse Plan a total of 11.8 acres (4.8 hectares) would become public open space; of this, approximately 9.8 acres (four hectares) would be passive space, including the 1.7-acre (0.7-hectare) Naval Hospital Cemetery. This increment of public open space would substantially improve the open space ratios for residents and workers in the area.

The BQE frontage at the site's southeast corner is proposed for retail commercial use, such as a convenience store or fast food establishment that would occupy three existing buildings there. While this would introduce a new use to the neighborhood, the location at Flushing Avenue and Williamsburg Street is an appropriate vehicular node and would provide a useful amenity to area residents and workers. It would also add some vitality to a relatively desolate corner.

The reuse of existing buildings with no new construction would cause essentially no impact to existing visual resources in the area. Some minor changes, such as alteration of the perimeter fence and gateways, are expected to improve the appearance of NAVSTA Brooklyn's exterior, and active use of the facility would be a major improvement over its present forlorn look of buildings with boarded-up windows.

The Reuse Plan would have no significant adverse impacts on neighborhood character but would provide numerous positive impacts, particularly in terms of providing the neighborhood with a major community facility for institutional and open space purposes, and for providing significant employment opportunities.

4.1.3 Residential Alternative

Land Use

On site, the Residential Alternative (Subchapter 2.4.2) shares several basic elements with the Reuse Plan, including the proposed industrial reuse of the buildings in the northern triangle and western industrial sector and the commercial reuse of buildings on the BQE frontage. It differs by proposing residential reuse of the campus buildings, not permitted under existing zoning. Most of these structures were historically residential and would be relatively easy to renovate for residential use. The hospital is the major structure requiring extensive renovation to convert to residential purposes. No new building construction is proposed. The buildings to be reused as residences would be divided into 94 housing units, with a total of 137,240 sq ft (12,760 sq m), but fewer or greater numbers could be generated depending on the unit type and size.

As with the Reuse Plan, the Residential Alternative is compatible with the historic uses of the site and the surrounding community, and considering the small total number of dwelling units, it would not have adverse land use impacts, although there would be zoning issues that are addressed next.

Zoning

While conforming with the historic uses of this part of the NAVSTA Brooklyn site, residential reuse would require a rezoning of the campus portion of the site in order to be permitted. (When operated as a federal facility, the city's industrial zoning with its prohibition on residential use did not apply.) The proposed zoning for the campus sector is R6 under this alternative. Although residential uses are located within two blocks of the site to the south and northeast, the heavy industrial uses of the contiguous Navy Yard or the M1 light industrial zoning on NAVSTA Brooklyn's other boundaries would make this new residential district something of a small island. It was partly for this reason that the Reuse Plan did not pursue a residential option.

Another potentially problematic aspect of rezoning the campus to residential use is the city's zoning requirement of a 300-ft (91-m) buffer within industrial districts contiguous with residential districts where operations within this buffer must conform to M1 performance standards. This could pose potential problems for the contiguous portions of the Navy Yard that are currently zoned M3 if they were to be occupied by heavy manufacturing. At present, this would most likely apply to potential users of Bldg 2 (foundry), which is immediately west of the hospital and would be within this 300-ft (91-m) buffer zone. The present tenant, operating under an interim lease, manufactures prefabricated homes there and would not be affected by this provision.

The R6 zoning would permit the rehabilitated structures to conform with zoning. The portion of the site that would be devoted to residential use is approximately 18.3 acres (7.4 hectares), or 797,148 sq ft (74,055 sq m). The residential reuse would account for about 172,840 sq ft (16,060 sq m), representing an FAR of about 0.22, which is well within the permitted FAR of 2.43. The footprints

of these buildings account for approximately 65,200 sq ft (6,057 sq m), or about eight percent of the campus portion of the site, and are well within the 33 percent open space requirement (OSR). The amount of parking ordinarily required for R6 is 70 percent of the number of units, where group parking is provided. Thus, for the 94 units proposed under this scenario, parking spaces for 66 vehicles would be provided.

Public Policy

NAVSTA Brooklyn is located within the coastal zone boundary of New York City. As noted in Subchapter 3.1.3, the LWRP includes a set of 56 policy statements (44 state and 12 city policies) that address the waterfront's important resources; the 56 policies are provided as Appendix F. Those that pertain and are applicable to the Residential Alternative are the same as for the Reuse Plan (Table 4.1-2).

The one difference to be noted applies to New York City Policy F, which states: *Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of: immobile user groups; and communities without adequate waterfront park space and/or facilities.*

Implementation of the Residential Alternative would only slightly increase the level and types of access to the coastal zone by providing access to the Naval Hospital Cemetery (approximately 1.7 acres [0.7 hectares]) as passive open space, compared to the 11.8 acres. (4.8 hectares) proposed under the Reuse Plan.

Other Public Policy

The Residential Alternative would have no effect on the nearby Williamsburg I Urban Renewal Area.

Neighborhood Character

Compared to the Reuse Plan, the only difference that the Residential Alternative represents is the introduction of residents (in place of the institutional and recreational elements proposed for the hospital campus area). As with the Reuse Plan, no significant adverse impacts are anticipated. Positive impacts of the Residential Alternative would include the adaptive reuse of the existing buildings and the creation of employment opportunities, housing opportunities for a modest number of households (about 94), and the provision of new public open space (the cemetery area for passive open space).

4.1.4 Museum Alternative

Land Use

The Museum Alternative, described in Subchapter 2.4.3, would reuse the campus portion of the site for educational/exhibition uses (Use Group 3 in the NYC Zoning Resolution). Those portions of the NAVSTA Brooklyn site designated for industrial use in the city's Reuse Plan (northern triangle and western sector) continue to be designated for those uses under this alternative; however, the BQE frontage area would also be included in the museum complex. No new building construction is proposed.

As with the Reuse Plan, the reuse of the industrial buildings is compatible with land uses in the study area. The proposed museum element represents a new use for the site; however, it would be a use that is particularly responsive to the cultural history of the site and would provide a useful educational resource for the community. It would not create adverse land use impacts for the area.

Zoning

In order to conform to the NYC Zoning Resolution, a museum use on the site would require a rezoning action. The 20-acre (eight-hectare) area to be devoted to the museum would need rezoning as a C2-6 district, which is a general commercial district permitting this type of community facility with a commercial FAR of 2.0 (up to 6.5 FAR for community facilities) and with no parking requirement. The zoning of the two areas of the site to continue in industrial use (northern triangle and western industrial sector) would remain M3-1.

Under the C2-6 zoning proposed for the Museum Alternative, the Zoning Resolution permits a wide array of uses ranging from Use Groups 1 through 9 and 14. Of these:

- Use Groups 1 and 2 permit all types of residential development;
- Use Groups 3 and 4 cover a wide variety of community facilities, including colleges, hospitals, nursing homes, medical facilities, and non-profit clubs;
- Use Group 5 permits hotels and motels;
- Use Groups 6 through 9 permit a wide variety of local and major retail uses, small wholesale operations (under 2,500 sq ft [232 sq m]), professional offices, theaters, auto service uses, and public utilities; and
- Use Group 14 is oriented to boating uses (Zoning Resolution 32-00).

The floor area permitted for commercial uses is a maximum of 2.0 FAR. For residential uses, the maximum permitted floor area ranges from 2.8-3.4 FAR, an equivalent to R-7 zoning. For community facility uses the maximum permitted floor area is 6.5 FAR (Zoning Resolution 33-00). There are no parking requirements for most commercial and community facility uses in C2-6

districts, while residential uses require parking for 50 percent of the total residential units (Zoning Resolution 36-20).

Public Policy

NAVSTA Brooklyn is located within the coastal zone boundary of New York City. As noted in Subchapter 3.1.3, the LWRP includes a set of 56 policy statements that address the waterfront's important resources; the 56 policies are provided as Appendix F. Those that pertain and are applicable to the Museum Alternative are the same as for the Reuse Plan (Table 4.1-2).

The one difference to be noted applies to New York City Policy F, which states: *Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of: immobile user groups; and communities without adequate waterfront park space and/or facilities.*

The Museum Alternative would increase the level and types of access to the coastal zone. The approximately 18.3-acre (7.4-hectare) hospital campus would provide a passive open space resource but is unlikely to be a mapped parkland. However, it is assumed the museum grounds and cemetery area would be publicly accessible during normal museum hours.

Other Public Policy

The Museum Alternative would have no effect on the nearby Williamsburg I Urban Renewal Area.

Neighborhood Character

The Museum Alternative would alter two components of the Reuse Plan: the campus area and the BQE frontage area would be devoted to museum use, rather than community facilities and retail. As with the Reuse Plan, the reuse of the industrial buildings for similar purposes is compatible with existing land uses in the study area. The proposed museum element would represent a new cultural and educational amenity for the community. No significant adverse impacts are anticipated upon neighborhood character. Positive impacts include adaptive reuse of the existing buildings, the creation of employment opportunities, and the provision of 11.2 acres (4.5 hectares) of new passive open space.

4.1.5 As-of-Right Alternative

Land Use

The As-of-Right Alternative is described in Subchapter 2.4.4 and provides for the full buildout of the site as permitted by existing NYC zoning. Four principal buildings (the hospital, Surgeon's House, lab, and foundry) would be retained; all other structures would be demolished and new industrial/warehouse structures would be constructed to the maximum bulk permitted. The cemetery area would be open space and remain unbuilt.

This intensive-development scenario would radically alter the campus area and eliminate the present feel of open space that prevails in this area of the site. The land use implications of the As-of-Right Alternative represent a level of intensity that has not been experienced at the site since the end of WWII. The industrial/warehouse uses considered would be compatible with the adjacent manufacturing districts (M3-1 and M1-2), where older multi-story warehouses and industrial activities characterize the surrounding blocks but, as a result of urban renewal and rezoning activities, would be less compatible with the growing residential activity in the nearby South Williamsburg area, northeast of the site. By definition this alternative is "as-of-right" based on the existing M3-1 zoning.

Zoning

The existing M3-1 zoning permits a maximum floor area of about 2,512,000 sq ft (233,500 sq m) based on the site area of approximately 1,256,000 sq ft (116,682 sq m) and permitted 2.0 FAR. The retained buildings would account for about 423,000 sq ft (39,300 sq m) of floor area; deducting this floor area provides maximum new construction of about 2,089,000 sq ft (194,000 sq m), as shown in Table 4.1-3.

Parking requirements vary according to type of use, ranging from one space per 300 sq ft for general retail to one space per 2,000 sq ft, or per three employees (whichever is lower), for warehouse/storage uses. The As-of-Right Alternative considered here would be mostly of the warehouse/storage type with the requirement of one space per 2,000 sq ft (i.e., about 1,250 spaces). The required parking, assuming 300 sq ft (28 sq m) per space, would thus occupy approximately 376,000 sq ft (35,000 sq m).

Deducting the parking, the footprints of the retained buildings and the cemetery area leaves approximately 690,000 sq ft (64,100 sq m) to accommodate the new construction and roadways. Allowing ten percent of the area for roadways leaves approximately 621,000 sq ft (57,700 sq m) to accommodate the permitted increment, which would need to be accommodated in three- to four-story structures.

Table 4.1-3

As-of-Right Alternative Full Buildout under Existing M3 Zoning

Variable	Square Feet	Square Meters
Site Area	1,256,000	11,682
Max Permitted Floor Area	2,512,000	233,500
Retained Bldgs Floor Area	423,000	39,300
Permitted New Floor Area	2,089,000	194,000
Footprint of Retained Buildings	118,000	11,000
Cemetery Area	72,300	6,700
Parking Area	376,000	35,000
Roadways	69,000	6,400
Remaining Site Area to Accommodate New Floor Area	621,000	57,700
Number of Stories to Accommodate New Floor Area	3.36	3.36

While the cost and design of such multiple-story industrial/warehousing space would be unlikely to find a market in Brooklyn, examining this maximum buildout alternative is helpful for comparison of development intensities.

Public Policy

NAVSTA Brooklyn is located within the coastal zone boundary of New York City. As noted in Subchapter 3.1.3, the LWRP includes a set of 56 policy statements (44 state and 12 city policies) that address the waterfront's important resources; the 56 policies are provided as Appendix F. Those that pertain and are applicable to the As-of-Right Alternative are the same as for the Reuse Plan (Table 4.1-2).

There are two differences to be noted:

- *Policy 4: Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity.*

Situated in one of the major ports of New York, the As-of-Right Alternative would encourage the development of the NAVSTA Brooklyn site through the adaptive reuse of four existing buildings that contributed to the unique identity of the Brooklyn Navy Yard, and the full buildout of new industrial/warehouse buildings. The two NYC-landmarked buildings (the Naval Hospital and the Surgeon's House) would be retained but the historic district determined eligible for the National Register by the SHPO would be severely impacted.

- *New York City Policy F: Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of: immobile user groups; and communities without adequate waterfront park space and/or facilities.*

Implementation of the As-of-Right Alternative would only slightly increase the level and types of access to the coastal zone by providing access to the Naval Hospital Cemetery (approximately 1.7 acres [0.7 hectares]) as passive open space, compared to 11.8 acres. (4.8 hectares) provided under the Reuse Plan.

Other Public Policy

The As-of-Right Alternative would have no effect on the nearby Williamsburg I Urban Renewal Area.

Neighborhood Character

Compared to the Reuse Plan, the As-of-Right Alternative would add substantially greater employment to the site as all available space would be developed to the maximum permitted under current zoning. Only four of the existing buildings would be retained (hospital, Surgeon's House, lab, and foundry); all other structures would be demolished to make room for the industrial/ warehouse development. This action would have significant adverse impacts on the historic architectural resources of the site. While this alternative would generate substantial employment opportunities, there would be no provision of community facilities or new open space, except for the 1.7-acre (0.7-hectare) cemetery. However, more industrial/warehouse activity at the site would not be out of character with the surrounding industrial context.

4.2 Socioeconomics

4.2.1 No Action Alternative

Under the No Action Alternative, the Navy would entirely vacate NAVSTA Brooklyn. Although the land would not be disposed of, it would remain as federal government land. NAVSTA Brooklyn would be closed in accordance with *Base Realignment and Closure Facility Layaway and Caretaker Maintenance Standards* (US Navy, 1994). Continued government ownership of the property would have no benefit to the Navy as the Navy would incur continued liability for an asset with no functional, operational, or strategic value. Continued federal government ownership would also have no benefit for the local community since such ownership would prevent the possibility of viable and productive use of the land. This alternative is developed to provide a future baseline, representing no action conditions, against which other alternatives may be compared.

Demography

The No Action Alternative would have no demographic impacts.

Employment and Income

Under the No Action Alternative, there would be no redevelopment at the base and hence no new income would be generated by businesses, institutions, and their employees. Moreover, the virtual abandonment of the base could further detract from the quality of local conditions if vandalism or visual blight were to escalate, thereby lowering property values and/or inducing more businesses/households to leave the area.

Fiscal Impacts

Under the No Action Alternative, there would be no redevelopment at the base and hence no new tax revenues would be collected from real property taxes, earned income taxes, or other relevant business taxes and fees. The No Action Alternative implies that there would be no direct or induced growth in the area as a result of the redeveloped base and, hence, there would be no increment of costs associated with the provision of additional services to new households/businesses.

Housing

Under the No Action Alternative there would be no redevelopment at the base and no new housing would be constructed there. There would be no new workers and, hence, no new demand created for housing in the city by the reuse of NAVSTA Brooklyn.

4.2.2 Reuse Plan

Demography

The proposed Reuse Plan, described in Subchapter 2.3, would introduce some new worker and visitor populations to the site but would generate no direct new residents (City of New York, 1996). In addition, it would provide for the adaptive reuse of existing structures with no new construction.

Institutional uses would occupy the campus area of the NAVSTA Brooklyn site. The Reuse Plan does not provide estimates of the numbers of jobs or visitors projected; consequently, the estimates adopted here are intended to be indicative of the potential for job creation under this development scenario.

Various industrial and commercial uses would occupy the northern triangle, the western industrial sector, and the BQE frontage. A wide range of possible industrial/commercial employers could be accommodated in the buildings associated with the Reuse Plan's projected uses. The square feet of the buildings provides a reasonable basis from which to project employment; however, a wide range of space-per-employee ratios can be associated with the light industrial, warehousing, research and development, and office commercial uses that are potential users. These space ratios can range from 300 sq ft (28 sq m) to 1,000 sq ft (93 sq m) per employee (ITE, 1997). This analysis adopts the ratios suggested in the *Development Impact Assessment Manual* (Urban Land Institute [ULI], 1994), with an average of one worker per 500 sq ft for industrial space, one worker per 400 sq ft for retail space, and one worker per 250 sq ft for public space. These ratios generate an estimated total employment of 1,630, as shown in Table 4.2-1.

The Reuse Plan does not provide a phase-in schedule for the projected reuse and employment. Consequently, for the purposes of this EIS, it is assumed that the plan would be fully implemented by the year 2002. In reality a gradual buildup is likely, with some buildings being more quickly renovated and occupied than others.

Placed in the relative context of the NYC labor force, an increase of 1,630 jobs under the Reuse Plan would represent 0.03 percent of the 1990 resident labor force, or 0.1 percent (one-tenth of one percent) of Brooklyn's resident labor force. At these proportions, the anticipated employment is a very small increment and would be unlikely to stimulate any discernable demographic changes citywide or in the borough of Brooklyn. If all prospective employees were drawn from the pool of NYC unemployed workers, recorded at 262,744 in October 1998 (Bureau of Labor Statistics [BLS], 1998), it would reduce the numbers of those who were unemployed by two-thirds of one percent (0.62 percent). This level of new employment would not be likely to generate any in-migration of new workers to the city.

Table 4.2-1

Reuse Plan Employment Estimates

Employment Sector	Space Sq Ft (Sq M)	Sq Ft per Employee	Number of Employees[1]
Industrial	459,800 (42,715)	500	920
Retail/Commercial	52,500 (4,877)	400	130
Institutional	145,000 (13,470)	250	580
Total[2]	657,300 (61,063)		1,630

Note: [1] Numbers rounded to nearest ten.
[2] The open space/parkland would be likely to generate several new jobs for maintenance; these are included here among the institutional employment.

Table 4.2-2

Reuse Plan Earnings Estimates

Employment Sector	Number of Employees	Hourly Rate	Annual Earnings[1] ($1,000s)
Industrial	920	13.87[2]	27,205
Retail/Commercial	130	8.81	2,442
Institutional	580	13.02[3]	16,100
Total	1,630		45,747

Notes: [1] Assumes 2,132 hours per year.
[2] Takes the mean of $13.56 for manufacturing production workers and $14.19 for wholesale production workers.
[3] Uses service workers for "institutional" workers.
Source: Hourly wage rates from US Bureau of Labor Statistics, October 1998.

Employment and Income

The mean earnings associated with the 1,630 new permanent jobs anticipated under the Reuse Plan are estimated by industry category in Table 4.2-2. Industry categories have been estimated in 1998 dollars based on national data provided by the BLS. The total projected annual earnings of this proposed employment, in 1998 dollars, would be $45.7 million.

In addition to the direct permanent employment, spending by the households of these employed workers would generate secondary economic activity. Estimates of these secondary jobs and earnings have been derived from the econometric input/output (I/O) model known as RIMS II, created for NYC by the US Bureau of Economic Analysis (BEA, 1994). In this instance, the categories of employment are allocated to their respective standard industrial classification codes (SICC) in the detailed 471-industry I/O matrix, which is then used to obtain the industry-specific direct-effect multipliers (Table 4.2-3).

Industrial jobs are here divided in two, with half applied to "management and consulting services, testing and research labs" in order to capture some of the prospective diversity of "industrial" employment at the redeveloped base. The total employment and earnings generated by the proposed activities are computed, and indirect effects are obtained by deducting the direct employment and earnings. Total direct and indirect employment is computed at 2,500 jobs, with indirect employment representing 35 percent of this at 872 jobs. Total earnings are projected to be about $70 million, of which almost $24 million would be generated indirectly.

In addition to direct and indirect permanent jobs, there would be both direct and indirect temporary jobs generated by the construction activity as the earnings from the construction employment circulate in the local economy. Order-of-magnitude estimates of renovation costs associated with the commercial and institutional buildings were discussed in Subchapter 2.3.3 and are shown in Table 4.2-4. Renovation costs under the Reuse Plan are estimated at $9.9 million and infrastructure/site development costs are estimated at $8.6 million (inflated from the city consultant's estimate of $7.2 million [Abeles, Phillips, Preiss & Shapiro, 1992]), for total construction expenditures of about $18.5 million.

Based on these estimated construction costs, it is possible to project the number of direct construction jobs and indirect jobs generated by this construction activity. The total economic impact of the construction expenditures can be derived from the BEA RIMS II model for NYC. On the basis of the employment and earnings multipliers provided by the model, employment and income effects of the temporary construction employment are estimated. These are shown in Table 4.2-5.

Table 4.2-3

Reuse Plan Direct and Indirect Employment and Earnings

Industrial Classification	Industrial Code	Direct Jobs	Direct Earnings ($ million)	I/O Multipliers		Total Jobs	Indirect Jobs	Total Earnings ($ million)	Indirect Earnings ($ million)
				Jobs	Earnings				
Industrial	62.0100	460	13.6	1.6411	1.3878	755	295	18.9	5.3
Mgt. Consultant Services, etc.	73.0105	460	13.6	1.6978	1.4511	781	321	19.7	6.1
Retail (Eating/ Drinking)	74.0000	130	2.4	1.2347	1.5491	161	31	3.8	1.3
Institutional (Social Services)	77.0900	580	16.1	1.3888	1.697	806	226	27.3	11.2
Totals		1,630	45.7			2,502	872	69.5	23.9
Notes: Dollars in 1998 $. Numbers may not total exactly due to rounding. Source: Based on US BEA RIMS II model of NYC, 1994.									

Table 4.2-4

Reuse Plan Estimated Construction Costs

Project	Space Sq Ft (Sq M)	$ Cost Per Sq Ft (Sq M)	Est. Construction Costs ($millions)
Industrial	459,800 (42,715)	0	0.0
Retail/Commercial	52,500 (4,877)	50	2.6
Institutional	145,000 (13,500)	50	7.3
Site Development/Infrastructure	N/A	N/A	8.6
Total	657,200 (61,053)		18.5

Table 4.2-5

Reuse Plan Construction and Indirect Employment from Construction Activity

Activity	Employment	Earnings ($ millions)
Direct Construction	141	6.3
Indirect Other Industries	76	2.3
Totals	217	8.6
Source: Based on US BEA RIMS II model of NYC, 1994.		

Direct construction employment is projected by the RIMS II model to provide approximately 141 person-year jobs; if the renovation/development occurred over two years, this would average 70 jobs in each year. Indirect employment generated by the construction spending is estimated at 76 jobs, again spread over the development period. Total temporary employment is thus estimated at 217 jobs. Assuming average annual construction wages of $45,000 (including benefits), total earnings from the direct construction jobs are estimated at $6.3 million; assuming indirect job wages of $30,000 annually, total earnings are estimated at $2.3 million. Thus, total direct and indirect earnings, over the buildout period, are estimated at $8.6 million.

Fiscal Impacts

As described in Chapter 2, the Reuse Plan suggests substantial fiscal benefits from the development of the base. At full buildout, it is estimated that the Reuse Plan would generate 1,630 direct jobs. These jobs, and employment from secondary economic effects and from the temporary construction phase, would generate new revenues from taxes and fees. Estimates of these new revenues are not made in the Reuse Plan; consequently, order-of-magnitude estimates are provided here.

No new property taxes are anticipated because the industrial/commercial parcels would be transferred to the BNYDC; as a public authority, the BNYDC is exempt from local real property taxes. The campus portion that would be operated by some institutional use is presumed to hold not-for-profit status and also not be subject to property taxes.

Both New York City and New York State would benefit from personal and corporate income taxes, from sales taxes, and from various other taxes and fees. Applying the city and state income tax schedules, and assuming employees are NYC residents, generates annual totals of almost $1.4 million for the state and $1 million for the city from the direct permanent employees. Table 4.2-6 shows anticipated income and sales tax revenues from both the permanent operations and the temporary activity associated with the construction phase. Including personal and corporate income and sales taxes, the state can anticipate total annual revenues of almost $4.9 million and the city $3.8 million from permanent operations under the Reuse Plan. These new revenues would represent approximately 0.007 percent of the state budget and 0.01 percent of the city budget.

Short-term revenues of $533,000 to the state and $452,000 to the city are projected, spread over the construction period. Additional revenue are also likely to be collected from a variety of miscellaneous fees and charges but because these are relatively small and difficult to predict, they are omitted in this analysis.

It is expected that the new employees of the redeveloped base and their households would not generate new residential construction but would currently be city residents already paying property taxes and receiving city services.

Table 4.2-6

Reuse Plan: Projected New Tax Revenues

Category	Personal Income[1] ($1,000s)		Corporate Income[2] ($1,000s)		Sales Taxes[3] ($1,000s)		Totals ($1,000s)	
	NYS	NYC	NYS	NYC	NYS	NYC	NYS	NYC
Permanent Direct	1,354	1,017	914	823	486	457	2,755	2,298
Permanent Indir.	481	335	523	470	278	261	1,282	1,067
Merchandise	0	0	0	0	446	420	446	420
Subtotal	1,835	1,352	1,438	1,294	1,210	1,139	4,484	3,785
Temporary Direct	171	123	127	114	51	48	349	285
Temporary Indir.	42	29	46	41	18	23	106	93
Constr. Materials	0	0	0	0	79	74	79	74
Subtotal	213	152	173	155	147	144	533	452
Total	2,049	1,505	1,611	1,450	1,357	1,283	5,017	4,237

Notes: [1] Assumes NYC resident, married with three exemptions.
[2] Tax rate on assumed 10% profits on value added (assumed as twice labor cost).
[3] Sales tax apportioned at 0.0425 for state and 0.04 for city; applied to:
- 25% of worker household income;
- "Merchandise" assumes half of the gross sq ft will generate $400 per sq ft annual sales, 100% taxable; and
- "Construction materials" assumes 50% of construction cost are for materials and 20% of these are subject to sales taxes.

Numbers may not total exactly due to rounding.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President Clinton on February 11, 1994, requires federal agencies to take appropriate and necessary steps, to the greatest extent practicable and permitted by law, to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations. The goal of EO 12898 is stated as:

> *... each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States...* (Section 1–101, EO 12898, 1994)

The purpose of the environmental justice review is to determine if a disproportionate share of the proposed project's socioeconomic impacts that may be considered significantly adverse are borne by low-income and minority communities. The review consists of two parts:

- The identification of disadvantaged (low-income and/or minority) populations; and
- A determination of whether any disadvantaged populations are disproportionately impacted by the proposed project.

Disadvantaged populations are minority and low-income persons who are identified on the basis of their percentage of the population of the affected area. The affected area is interpreted as that area which the proposed project will or may have an effect on. Guidance for interpreting these concepts in terms of geographic analysis is based on EO 12898 and "*Interim Guidance For Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis* (USEPA, September 1997). The source of USEPA's *Interim Guidance* was the Interagency Working Group (IWG) on Environmental Justice, comprised of 17 departments and agencies.

This document's guidance for identifying minority populations is either: a) the minority population of the affected area exceeds 50 percent, or b) the minority population percentage of the affected area is meaningfully greater than the minority population of the general population or other appropriate unit of geographic analysis. The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, census tract, or other similar unit that is to be chosen so as not to artificially dilute or inflate the affected minority population.

The *Interim Guidance* suggests two tests for defining low-income populations in the affected area: a) the Department of Health and Human Services (HHS) poverty guidelines or b) the Department of Housing and Urban Development (HUD) definition of very low-income for the purpose of

housing benefits programs. Agencies are advised to apply the test that most accurately reflects the relative cost of living in the particular geographic are under consideration.

The data compiled to address the above disadvantaged population criteria, and to define the affected area, are based on the census tracts that comprise the study area for socioeconomic analysis. Data for NYC and Brooklyn are provided for comparative purposes. The socioeconomic study area for NAVSTA Brooklyn is shown in Figure 3.1-1, which also shows the 18 census tracts that encompass the study area. Data are extracted from the 1990 census STF3A. Appendix Tables B-3 and B-4, respectively, show minority and income characteristics of the resident population.

The African-American population of the study area comprises 30.1 percent in 1990, but reaches a majority in six of the 18 tracts. This proportion of African-Americans persons is smaller than that for Brooklyn (34.7 percent) but greater than for the city as a whole. Persons of Hispanic origin may be of any race and represented 24.6 percent of the study area's population in 1990, a figure equal to their proportion of the city's population (24.4 percent) and higher than their portion of Brooklyn (20.1 percent). While strongly represented in many of the tracts, Hispanic persons reach a majority in four of the tracts. The white non-Hispanic population of the study area accounted for 46.8 percent in 1990, and represented a majority in six tracts. Thus minority populations represent a majority in the study area.

In terms of income, the percent of persons below poverty (1989 data) reached 40.3 percent, compared to 22.6 percent for Brooklyn and 19.3 percent for the city. In six tracts, the population of persons below poverty was a majority. Thus the study area may be generally defined as having a high proportion of low-income persons.

The nature of the proposed action, the disposal and reuse of NAVSTA Brooklyn, does not permit alternatives to the location of the action, only with respect to reuse options. The potential impacts of the Reuse Plan and its alternatives, as evaluated in accordance with EO 12898, follows.

The proposed Reuse Plan, described in Subchapter 2.3, would introduce new worker and visitor populations, to be accommodated in the adaptive reuse of existing structures on-site. Community institutional uses would occupy the campus area of the NAVSTA Brooklyn site, and various industrial and commercial uses would occupy the northern triangle, the western industrial sector, and the BQE frontage, providing an estimated total employment of 1,630. Many of these jobs would provide employment opportunities to area residents. These would be particularly valuable as blue-collar and less-skilled jobs for the disadvantaged populations of the community. The proposed project would create no displacement of residents or businesses.

Project-related impacts to local parks and community facilities are considered significantly positive. An increase of 11.8 acres (4.8 hectares) in the supply of publicly accessible open space would be a substantial complement to the area's relatively low inventory of these resources. The proposed

project is also not expected to result in any significantly adverse noise or air quality impacts within the limits of the project area or in the nearby community.

The direct and indirect effects of the proposed disposal and reuse are not expected to cause adverse environmental or economic impacts specific to any groups or individuals from minority or low-income populations residing in the study area. All populations would be affected equally and in the same manner by the proposed action. In conclusion, the proposed Reuse Plan would not result in any significantly adverse impacts that would disproportionately affect minority or low-income populations.

4.2.3 Residential Alternative

Demography

The Residential Alternative would add an estimated 94 households to the site. Based on the 1990 census average of 2.5 persons per household in NYC, the total population associated with those 94 households is projected to be 235. If the age distribution identified in the 1990 census for NYC were also to apply to this future population, it would produce a distribution with:

- 13.1 percent over 65 years of age;
- 61.2 percent between 20 and 64; and
- 25.7 percent aged 19 or less. Of these young persons:
  - Those under age 5 would represent 7 percent of the total;
  - Ages 5-9 would represent 6.2 percent;
  - Ages 10-14 would represent 6.1 percent; and
  - Ages 15-19 would represent 6.4 percent.

The permanent employment generated in the industrial/commercial sectors of the site would total 1,050 jobs, or 36 percent less than with the Reuse Plan. As with the Reuse Plan, it is assumed that these new jobs would be occupied by current NYC residents and that the scale of new employment would be insufficient to generate discernable in-migration of new workers to NYC.

Employment and Income

The mean earnings associated with the 1,050 new permanent jobs projected under the Residential Alternative are estimated, by industry category, in Table 4.2-7. Industry categories have been estimated in 1998 dollars based on national data from the BLS. The total projected annual earnings of this proposed employment, in 1998 dollars, would be $29.6 million.

Table 4.2-7

Residential Alternative Direct Earnings Estimates

Employment Sector	Number of Employees	Hourly Rate	Annual Earnings[1] ($1,000s)
Industrial	920	13.87[2]	27,205
Retail/Commercial	130	8.81	2,442
Total	1,050		29,647

Notes: [1] Assumes 2,132 hours per year.
[2] Takes the mean of $13.56 for manufacturing production workers and $14.19 for wholesale production workers.
Source: Hourly wage rates from US BLS, October 1998.

Table 4.2-8

Residential Alternative Direct and Indirect Employment and Earnings

Industrial Classification	Industrial Code	Direct Jobs	Direct Earnings ($ million)	I/O Multipliers		Total Jobs	Indirect Jobs	Total Earnings ($ million)	Indirect Earnings ($ million)
				Jobs	Earnings				
Industrial	62.0100	460	13.6	1.6411	1.3878	755	295	18.9	5.3
Mgt. Consultant Services, etc.	73.0105	460	13.6	1.6978	1.4511	781	321	19.7	6.1
Retail (Eating/ Drinking)	74.0000	130	2.4	1.2347	1.5491	161	31	3.8	1.4
Totals		1,050	29.6			1,697	647	42.4	12.8

Notes: Dollars in 1998 $.
Numbers may not total exactly due to rounding.
Source: Based on US BEA RIMS II model of NYC, 1994.

The permanent employment and the spending by the households of these employed workers would create additional indirect jobs. Estimates of these secondary jobs and earnings have been derived from the RIMS II model for NYC, as in Subchapter 4.2.2. Again, the categories of employment are allocated to their respective SICC in the I/O matrix, and their industry-specific direct-effect multipliers are applied using similar assumptions to those in Table 4.2-5, except that there are no institutional jobs. The total employment and earnings generated by the proposed activities are computed and indirect effects are obtained by deducting the direct employment and earnings. Table 4.2-8 shows that the direct and indirect employment is computed at almost 1,700 jobs, with indirect employment accounting for 647 jobs, or 38 percent. Total earnings are projected to be $42.4 million, of which $12.8 million would be generated indirectly.

In addition to permanent jobs, there would be direct temporary jobs generated by the construction activity associated with the Residential Alternative, as well as indirect employment generated as the earnings from the construction employment circulate in the local economy. Order-of-magnitude estimates of renovation costs associated with the commercial and institutional buildings are discussed in Subchapter 2.3.2. The same $50 per sq ft renovation cost is assumed for the residential component as used for the institutional component; total renovation costs are thus estimated at $9.9 million, the same as for the Reuse Plan (Table 4.2-3), and infrastructure/site development costs are estimated at $8.6 million. In consequence, the direct and indirect construction employment and earnings are the same as with the Reuse Plan (Table 4.2-4), with 141 direct construction jobs with earnings of $6.3 million, and 76 indirect jobs earning $2.3 million.

Fiscal Impacts

As with the Reuse Plan, the Residential Alternative would generate substantial fiscal benefits by the redevelopment of NAVSTA Brooklyn. The Residential Alternative differs by adapting the structures associated with the hospital campus to residential use. It is assumed that the residential structures would be brought onto the tax rolls for property taxes or provide payments in lieu of taxes (PILOT). However, estimating the potential new tax revenues on the reuse of the structures for residential units is relatively complex. First, the appropriate tax class of the buildings would need to be determined.

If the residential component was held in single ownership and individual units leased, there would be different tax consequences than if individual owners held specific units. For this EIS, it is assumed that the units would all be under one owner and leased to tenants. This would place the 94 units in Residential Property Class II, with a tax rate of 10.739 per $100 of assessed value. Assessed values are also likely to be relatively complicated for these structures because of the lack of prior market history. The NYC Department of Finance, Real Property Division, would normally adopt the value of alterations as a basis for market value (Edelstein, 1998).

These values are estimated at $7.25 million. The tax office also modifies this "alterations value" approach to include a consideration of the property's income; for this document, it is assumed that sufficient income would be realized to cover the financing, operating and maintenance costs,

property tax, and profit requirements of the property. If the property were valued at $7.25 million, the assessed value would be set at 45 percent of this, or $3,262,500. The annual real property taxes would thus be $350,360.

However, a further complication is that the property would most likely be eligible for the city's tax exemption and abatement program known as J-51. This program provides a total abatement of tax on the land for 20 years and on the improvements for 12 years. As a result of the property's uncertain tax status and the fact that little or no property tax revenues would be collected for 12 years, it is not included further as a quantified estimate in this analysis. It should also be noted that the new residents of this property would receive the full array of municipal services and thus present a small increment to the city's fiscal expenditures. However, in the context of the $34 billion NYC budget (FY 1998), the increment would be negligible.

Other fiscal impacts would be more in line with the Reuse Plan, except that there would be less direct and indirect employment and the associated personal income, corporate income, and sales taxes. Table 4.2-9 provides estimates of these new revenues under the Residential Alternative. The table shows that NY State could anticipate about $3.2 million per year from the various income and sales taxes, and an additional $533,000 could accrue during the construction phase. For NYC, this alternative is estimated to generate $2.7 million per year, not including any potential property taxes that may be collected after 12 years when anticipated exemptions expire. An additional $452,000 is estimated to accrue to the city during the construction phase.

Environmental Justice

In terms of EO 12898, the alternatives to the Reuse Plan would have generally similar impacts to those described for the Reuse Plan. Differences in the number of employment opportunities, and the uses of the hospital campus, differentiate the alternatives (described in Subchapter 2.4). The Residential Alternative would provide on-site housing opportunities for approximately 94 households but because there is no presently-identified sponsor, it is assumed that these would be market-rate units and are unlikely to provide a resource to low-income persons. The Residential Alternative would limit the amount of new publicly accessible open space to the cemetery area. This alternative would not cause adverse environmental or economic impacts specific to any groups or individuals from minority or low-income populations residing in the study area.

Table 4.2-9

Residential Alternative: Projected New Tax Revenues[1]

Category	Personal Income[2] ($1,000s)		Corporate Income[3] ($1,000s)		Sales Taxes[4] ($1,000s)		Totals ($1,000s)	
	NYS	NYC	NYS	NYC	NYS	NYC	NYS	NYC
Permanent Direct	888	666	593	534	315	296	1,796	1,496
Permanent Indirect	356	248	387	348	206	194	950	791
Merchandise	0	0	0	0	446	420	446	420
Subtotals	1,244	914	980	882	967	910	3,192	2,707
Temporary Direct	171	123	127	114	51	48	349	285
Temporary Indirect	42	29	46	41	18	23	106	93
Constr. Materials	0	0	0	0	79	74	79	74
Subtotals	213	152	173	155	147	144	533	452
Total[5]	1,458	1,067	1,153	1,038	1,114	1,055	3,725	3,159

Notes: [1] Does not include potential real property taxes, as discussed in the text.
[2] Assumes NYC resident, married with three exemptions.
[3] Tax rate on assumed 10% profits on value added (assumed as twice labor cost).
[4] Sales tax apportioned at 0.0425 for state and 0.04 for city, applied to:
- 25% of worker household income;
- "Merchandise" assumes half of the gross commercial sq ft will generate $400 per sq ft annual sales, 100% taxable; and
- "Construction materials" assumes 50% of construction cost are for materials and 20% of these are subject to sales taxes.

[5] Numbers may not total exactly due to rounding.

4.2.4 Museum Alternative

Demography

The Museum Alternative would not introduce residents to the site, but would reduce the number of anticipated jobs and potentially introduce a substantial visitor population to the site. For the purposes of this document, it is assumed that the museum element would generate 200,000 visitors per year.

Employment and Income

The employment and earnings associated with the new permanent jobs projected under the Museum Alternative are estimated in Table 4.2-10. The total direct employment is estimated at 1,118 with associated earnings of $32.7 million, in 1998 dollars.

The permanent employment estimated under the Museum Alternative would generate additional secondary economic activity. Estimates of these secondary jobs and earnings have been derived from the RIMS II model for NYC, and the categories of employment are allocated to their respective SICC in the detailed I/O matrix used to obtain the industry-specific direct-effect multipliers. The total employment and earnings generated by the proposed activity are computed and indirect effects are obtained by deducting the direct employment and earnings.

Table 4.2-11 shows the direct and indirect employment computed at 1,782 jobs, with indirect employment accounting for 764 jobs, or 37 percent. Total earnings are projected to be $46.7 million, of which $14 million, or 30 percent, would be generated indirectly.

In addition to the permanent jobs, there would be temporary jobs generated by the anticipated construction activity, and indirect employment generated as the earnings from the construction employment circulate in the local economy. Construction expenditures for the Museum Alternative are likely to be similar to those of the Reuse Plan, with total costs estimated at $18.5 million. The direct construction jobs/earnings and other indirect jobs/earnings would also be the same as for the Reuse Plan (i.e., 141 direct construction jobs with earnings of $6.3 million and 76 indirect jobs with earnings of $2.3 million).

Fiscal Impacts

As with the Reuse Plan, the Museum Alternative has the potential to provide substantial fiscal benefits from the redevelopment of the base. Under the Museum Alternative, the estimated direct jobs would be 1,118, about 69 percent of the number projected under the Reuse Plan. Earnings are estimated at $32.7 million, about 72 percent of the amount projected under the Reuse Plan.

There would be no property taxes generated by the Museum Alternative, because the museum is expected to be a tax-exempt not-for-profit owner.

Table 4.2-10

Museum Alternative Direct Earnings Estimates

Employment Sector	Number of Employees	Hourly Rate	Annual Earnings[1] ($1,000s)
Industrial	920	13.87[2]	27,205
Museum	198[3]	13.02[4]	5,496
Total	1,118		32,701

Notes: [1] Assumes 2,132 hours per year.
[2] Takes the mean of $13.56 for manufacturing production workers and $14.19 for wholesale production workers.
[3] Assumes one worker per 1,000 sq ft.
[4] Uses same rate as for service workers.
Source: Hourly wage rates from US BLS, October 1998.

Table 4.2-11

Museum Alternative Direct and Indirect Employment and Earnings

Industrial Classification	Industrial Code	Direct Jobs	Direct Earnings ($ million)	I/O Multipliers		Total Jobs	Indirect Jobs	Total Earnings ($ million)	Indirect Earnings ($ million)
				Jobs	Earnings				
Industrial	62.0100	460	13.6	1.6411	1.3878	755	295	18.9	5.3
Mgt. Consultant Services, etc.	73.0105	460	13.6	1.6978	1.4511	781	321	19.7	6.1
Museum	76.0206	198	5.5	1.244	1.4695	246	48	8.1	2.6
Totals		1,118	32.7			1,782	664	46.7	14.0

Notes: Dollars in 1998 $.
Numbers may not total exactly due to rounding.
Source: Based on US BEA RIMS II model of NYC, 1994.

Other new revenues would be derived from the direct and indirect employment and associated personal income, corporate income, and sales taxes. Table 4.2-12 provides estimates of these new revenues under the Museum Alternative. The table shows that NY State could anticipate about $2.8 million per year from the various income and sales taxes plus $533,000 during the construction phase. For NYC, this alternative is estimated to generate almost $2.3. million per year, plus $452,000 during the construction phase.

Environmental Justice

In terms of EO 12898, the Museum Alternative would have generally similar impacts to those described for the Reuse Plan, but with a smaller number of anticipated employees. This alternative would not cause adverse environmental or economic impacts specific to any groups or individuals from minority or low-income populations residing in the study area.

4.2.5 As-of-Right Alternative

Demography

While the As-of-Right Alternative would introduce no new residents to the site, it would substantially increase the density of development. In addition, the number of potential direct jobs would be raised to a total of approximately 5,000, an increase over the Reuse Plan by a factor of 2.8. These employment numbers are still not considered large enough to generate a net in-migration of population to the city but are likely to be jobs taken by existing residents, ultimately reducing the city's unemployed labor force.

Employment and Income

The employment and earnings estimated for the As-of-Right Alternative are shown in Table 4.2-13. The 5,000 direct employment jobs projected at full buildout would have associated earnings of over $149.5 million. It is assumed that this employment would be roughly divided between manufacturing and warehouse-type jobs.

The direct permanent employment would generate additional secondary economic activity. Estimates of these secondary jobs and earnings have been derived from the RIMS II model for NYC, as used in the employment sections of the other alternatives. Total direct and indirect employment is computed at 7,575 jobs, with indirect employment estimated at 2,574, representing 34 percent of total employment. Total earnings are projected to be almost $207 million, in 1998 dollars, of which approximately $58 million would be generated indirectly. Table 4.2-14 shows the direct and indirect employment/earnings computed with the RIMS II model.

Table 4.2-12

Museum Alternative: Projected New Tax Revenues[1]

Category	Personal Income[2] ($1,000s)		Corporate Income[3] ($1,000s)		Sales Taxes[4] ($1,000s)		Totals ($1,000s)	
	NYS	NYC	NYS	NYC	NYS	NYC	NYS	NYC
Permanent Direct	1,003	752	654	589	347	327	2,004	1,667
Permanent Indirect	366	254	280	252	149	140	795	647
Subtotal	1,369	1,006	934	841	496	467	2,799	2,314
Temporary Direct	171	123	127	114	51	48	349	285
Temporary Indirect	42	29	46	41	18	23	106	93
Constr. Materials	0	0	0	0	79	74	79	74
Subtotal	213	152	173	155	147	144	533	452
Total[5]	1,582	1,160	1,107	996	643	611	3,333	2,767

Notes: [1] Does not include potential real property taxes, as discussed in the text.
[2] Assumes NYC resident, married with three exemptions.
[3] Tax rate on assumed 10% profits on value added (assumed as twice labor cost).
[4] Sales tax apportioned at 0.0425 for state and 0.04 for city, applied to:
- 25% of worker household income; and
- "Construction materials" assumes 50% of construction cost are for materials and 20% of these are subject to sales taxes.

Any merchandise and food sales associated with the museum are not included.
[5] Numbers may not total exactly due to rounding.

Table 4.2-13

As-of-Right Alternative Direct Earnings Estimates

Employment Sector	Number of Employees	Hourly Rate	Annual Earnings[1] ($1,000s)
Industrial	2,500	13.87[2]	73,927
Warehouse	2,500	14.19[3]	75,633
Total	5,000		149,560

Notes: [1] Assumes 2,132 hours per year.
[2] Takes the mean of $13.56 for manufacturing production workers and $14.19 for wholesale production workers.
[3] Assumes rate for wholesale workers.
Source: Hourly wage rates from US BLS, October 1998.

Table 4.2-14

As-of-Right Alternative Direct and Indirect Employment and Earnings

Industrial Classification	Industrial Code	Direct Jobs	Direct Earnings ($ million)	I/O Multipliers		Total Jobs	Indirect Jobs	Total Earnings ($ million)	Indirect Earnings ($ million)
				Jobs	Earnings				
Industrial	62.0100	2,500	73.9	1.6411	1.3878	4,103	1,603	102.6	28.7
Warehouse	73.0105	2,500	75.6	1.3886	1.3842	3,472	972	104.6	29.0
Totals		5,000	149.5			7,575	2,575	207.2	57.7

Notes: Dollars in 1998 $.
Numbers may not total exactly due to rounding.
Source: Based on US BEA RIMS II model of NYC, 1994.

In addition to the permanent jobs, there would be direct temporary jobs generated by anticipated construction activity, as well as indirect employment generated as the earnings from the construction employment circulate in the local economy. Capital expenditures for infrastructure elements (e.g., new roads, utilities, etc.) are assumed to be similar to the estimate of $8.6 million for the Reuse Plan. Other construction costs are estimated at $230 million. Applying the construction cost assumptions used in the other alternatives for the four buildings that would remain, and an estimated $100 per sq ft for the new industrial/warehouse space that would be constructed, total As-of-Right Alternative construction costs are estimated at $238.7 million. An estimated 1,821 direct construction jobs and 978 indirect jobs would be generated from temporary construction over the construction period. Earnings for the construction phase are estimated at $82 million for direct employment and $29 million for indirect employment.

Fiscal Impacts

As with the Reuse Plan, the As-of-Right Alternative would generate substantial fiscal benefits from the redevelopment of NAVSTA Brooklyn. Under the As-of-Right Alternative, the 5,000 estimated direct jobs generated would be 282 percent greater than under the Reuse Plan, and earnings are estimated at $149.5 million, about $100 million more.

Using the assumptions in Subchapter 4.2.1 on the fiscal impacts of the Reuse Plan, and pro-rating them to the program proposed under the As-of-Right Alternative, fiscal impact projections were made and are shown in Table 4.2-15. There are no property taxes expected from the As-of-Right Alternative, because the industrial area is assumed to become part of the tax-exempt BNYDC.

Other new revenues would be derived from the direct and indirect employment and associated earned income, corporate income, and sales taxes. Table 4.2-15 shows that NY State could anticipate almost $13.2 million per year from the various income and sales taxes plus $6.9 million during the construction phase. For NYC, this alternative is estimated to generate $10.8 million per year, plus $5.8 million during the construction phase.

Environmental Justice

Compared to the Reuse Plan and in terms of EO 12898, the As-of-Right Alternative would limit the amount of new publicly accessible open space to the cemetery area but would increase the number of direct job opportunities to about 5,000. This alternative would not be expected to cause adverse environmental or economic impacts specific to any groups or individuals from minority or low-income populations residing in the study area.

Table 4.2-15

As-of-Right Alternative: Projected New Tax Revenues[1]

Category	Personal Income[2] ($1,000s)		Corporate Income[3] ($1,000s)		Sales Taxes[4] ($1,000s)		Totals ($1,000s)	
	NYS	NYC	NYS	NYC	NYS	NYC	NYS	NYC
Permanent Direct	4,812	3,437	2,991	2,692	1,589	1,496	9,393	7,625
Permanent Indirect	1,421	988	1,544	1,390	820	772	3,786	3,151
Subtotals	6,233	4,425	4,535	4,082	2,409	2,268	13,179	10,776
Temporary Direct	2,214	1,595	1,639	1,475	652	615	4,506	3,685
Temporary Indirect	540	376	586	528	234	293	1,360	1,197
Constr. Materials	0	0	0	0	1,015	955	1,015	955
Subtotals	2,754	1,971	2,225	2,003	1,901	1,863	6,881	5,837
Total[5]	8,988	6,397	6,761	6,085	5,326	5,086	21,075	17,567

Notes: [1] Does not include potential real property taxes, as discussed in the text.
[2] Assumes NYC resident, married with three exemptions.
[3] Tax rate on assumed 10% profits on value added (assumed as twice labor cost.)
[4] Sales tax apportioned at 0.0425 for state and 0.04 for city, applied to:
- 25% of worker household income; and
- "Construction materials" assumes 50% of construction cost are for materials and 20% of these are subject to sales taxes.

Any merchandise and food sales associated with the museum are not included.
[5] Numbers may not total exactly due to rounding.

4.3 Community Facilities and Services

4.3.1 No Action Alternative

Under the No Action Alternative there would be no redevelopment at the base, and thus little or no new demand would be created for community services. The Navy would continue to own the property and incur property management responsibilities. The property would not provide opportunities for income- and revenue-generating employment and so would not yield additional funds for local government, which would have to continue backup police and fire-protection services to the vacant facility. A facility vacant over the long term can be a potential source of safety problems, including vandalism.

Over the period of 1990-2002, demographic projections for the study area indicate a population decrease of 999, or 1.9 percent (Claritas Data Services, 1997). No other major development projects are planned in the study area over this time frame; consequently, overall service demands are not expected to alter in any major way from the existing conditions described in Subchapter 3.3.

4.3.2 Reuse Plan

Education

The Reuse Plan would have no direct physical impacts on local schools and proposes no new residential population at NAVSTA Brooklyn; consequently, there would be no new service demands on local schools.

Health Care

The Reuse Plan would have no direct physical impacts on local hospitals and would add no new residential population to their service areas. The estimated new worker population at NAVSTA Brooklyn would be approximately 1,630, representing a small increment to the service area population of the two nearby hospitals, Brooklyn Hospital and Woodhull Hospital.

Police and Fire

The Reuse Plan would have no direct physical impacts on local police and fire facilities. The anticipated increase in worker population at the site would not be sufficient to create adverse impacts on the police and fire departments' abilities to meet the service needs of the study area (Tierney, 1998; Farrell, 1998).

Libraries

The Reuse Plan would not create a residential population and thus would not adversely impact the abilities of nearby libraries to serve their user populations.

Day Care Facilities

The Reuse Plan would introduce no households, and thus no children, to the site and so there would be no service impacts on local day-care facilities.

Parks and Recreation

The Reuse Plan would introduce no residents to the site; however, the institutional campus would receive an estimated 1,630 new workers and an estimated 200 visitors per day, resulting in a new non-resident population of approximately 1,830. The existing inventory of public open space resources within one-half mi (0.8 km), with a total of 20.63 acres (8.35 hectares), is detailed in Table 3.3-1 and within one-quarter mi (0.4 km), with a total of 13.48 acres (7.07 hectares), in Table 3.3-3.

The Reuse Plan would substantially add to the existing open space resources of the study area by opening the campus area to the public. A total of approximately 11.2 acres (4.5 hectares) of open space would be provided (2.4 acres [1.0 hectare] of active and 8.8 acres [3.6 hectares] of passive space, including the 1.7-acre [0.7-hectare] cemetery).

The resident population ratio would increase from its existing ratio of 0.397 acres (0.160 hectares) per 1,000 persons to 0.613 acres (0.248 hectares) per 1,000 persons, an increase of 54 percent. The non-resident ratio for passive space would substantially improve from the present ratio of 0.264 acres (0.106 hectares) per 1,000 persons to 1.12 acres (0.453 hectares) per 1,000 persons, an increase by a factor of four. The Reuse Plan's impacts on parks and recreation resources in the area would, therefore, be significantly positive.

4.3.3 Residential Alternative

Education

While the new residential population proposed for the campus portion would require adapting existing structures into an estimated 94 dwelling units, the Residential Alternative would have no direct physical impacts on local schools. There are no specific plans as to the sponsorship or size of these units but it is assumed that no more than 50 would be two-bedroom units, with the remainder as one-bedroom or studio units. Referring to the NYC CEQR Technical Manual's Table 3c-1 (NYC Mayor's Office, 1993), and adopting conservative assumptions (i.e., that all residents are in the

highest income category and that 50 percent of dwelling units have more than two bedrooms) produces a ratio of nine pupils per 100 dwelling units.

These nine projected students would be distributed as follows: one to high school; three to intermediate school; and five to elementary school. As noted in Subchapter 3.3.1 and Appendix Table C-1, five of the six elementary schools are well below capacity, both of the two intermediate schools are well below capacity, and the one high school is also well below capacity. Consequently, the Residential Alternative would create very minor service demands on local schools and would present no adverse impacts to these facilities.

Health Care

The Residential Alternative would have no direct physical impacts on local hospitals and would add only a small increment to the area's residential population. The 94 new units are estimated to add 235 residents, or less than half of one percent, to the study area's 1990 population; this is in the context of study-area population projections indicating a decline of 1.9 percent over 1990-2002 (Claritas Data Services, 1997). The estimated new worker population under the Residential Alternative would be approximately 1,050, thus representing a very small increment to the service population of the two nearby hospitals, Brooklyn Hospital and Woodhull Hospital.

Police and Fire

The Residential Alternative would have no direct physical impacts on local police and fire facilities and the anticipated increase in resident and worker population at the site would not be sufficient to create adverse impacts on the police and fire departments' abilities to meet the service needs of the study area (Tierney, 1998; Farrell, 1998).

Libraries

The Residential Alternative proposes only a small new residential population (in a larger context of projected population declines) and thus would not create adverse impacts on the abilities of nearby libraries to serve their user populations.

Day Care Facilities

The Residential Alternative would introduce 94 new households and their children to the site. It is assumed that these would be market-rate housing units with relatively higher-income households that would place minimal service demands on publicly assisted local day care facilities. A total of five day care-age children is estimated, which would represent 0.4 percent of the 1,188 slots in the local day care facilities (Appendix C, Table C-5).

Parks and Recreation

The Residential Alternative would introduce an estimated 235 new residents and 1,050 new workers to the site. The existing inventory of public open space resources within one-half mi (0.8 km), with a total of 20.63 acres (8.35 hectares), is detailed in Table 3.3-1 and within one-quarter mi (0.4 km), with a total of 13.48 acres (7.07 hectares), in Table 3.3-3.

The Residential Alternative would not add as much as the Reuse Plan to the publicly-accessible open space resources of the study area. Only the cemetery area is assumed to become publicly-accessible open space, providing 1.7 acres [0.7 hectares] of passive space under the Residential Alternative. The resident-population ratio would slightly improve from its existing ratio of 0.397 acres (0.160 hectares) per 1,000 persons to 0.428 acres (0.173 hectares) per 1,000 persons. The non-resident ratio for passive space would also improve slightly from the present ratio of 0.416 acres (0.168 hectares) per 1,000 persons to 0.423 acres (0.171 hectares) per 1,000 persons. The Residential Alternative's impacts on parks and recreation resources in the area would be positive.

4.3.4 Museum Alternative

In the categories of education, health care, police and fire services, libraries, and day care facilities, impacts under the Museum Alternative would be the same as for the Reuse Plan.

In the category of parks and recreation, the Museum Alternative would introduce an estimated 1,118 new workers and an estimated 200,000 visitors per year (550 per day). The existing inventory of public open space resources is as described for the Reuse Plan.

The Museum Alternative would add as much to the study area's publicly accessible open-space resources as the Reuse Plan; however, the increment is expected to be entirely passive in character. The campus area would be the museum grounds and, while public access may be limited to museum hours, the open space is assumed to be available for passive recreation. Under this alternative, all 11.2 acres (4.5 hectares) of open space in the campus area of NAVSTA Brooklyn would be counted as an addition to passive open-space resources in the area. The resident population ratio would substantially improve from its existing ratio of 0.397 acres (0.160 hectares) per 1,000 persons to 0.613 acres (0.248 hectares) per 1,000 persons, an increase of 54 percent. The non-resident ratio for passive space would also improve substantially, from the present ratio of 0.416 acres (0.168 hectares) per 1,000 persons to 1.47 acres (0.594 hectares) per 1,000 persons, an increase of 353 percent. The Museum Alternative's impacts on parks and recreation resources in the area would be significantly positive.

4.3.5 As-of-Right Alternative

While the estimated new worker population under the As-of-Right Alternative would be approximately 5,000 persons, representing an increment of 63 percent to the 1990 worker population in the quarter-mi (0.4-km) radius study area, this population would not be resident. Thus, in the categories of education, health care, police and fire services, libraries, and day care facilities, impacts would be the same as for the Reuse Plan.

In the category of parks and recreation, this alternative would add only the cemetery area (1.7 acres [0.7 hectares]) as passive open space. The resident population ratio would slightly improve from its existing ratio of 0.397 acres (0.160 hectares) per 1,000 persons to 0.43 acres (0.174 hectares) per 1,000 persons, an increase of eight percent. The non-resident ratio for passive space would decline from the present ratio of 0.416 acres (0.168 hectares) per 1,000 persons to 0.294 acres (0.118 hectares) per 1,000 persons, a reduction of 29 percent, but would remain above the DCP-recommended standard of 0.15 acres (0.06 hectares) per 1,000 non-residents.

4.4 Transportation

4.4.1 No Action Alternative

In order to predict future traffic volumes, it is necessary to analyze projected changes in the study area in terms of potential traffic generators (residential or employment centers that would likely be constructed, expanded, or closed by the build year of 2002) and compare them to the historic traffic conditions. In agreement with the recommended rate provided in the *City Environmental Quality Review – Technical Manual* (December 1993), an annual growth rate of one percent was used to account for background growth.

By the build year of 2002, two changes in project-area traffic generation are expected that would impact the No Action Alternative:

- A residential development (175 units) at Kent Avenue and Clymer Street; and
- A residential development (75 units) between Flushing Avenue and Wallabout Street and Bedford Avenue and Franklin Avenue.

Trips generated by these residential developments, which were analyzed as midrise apartments, were based on rates provided in *Trip Generation, 6th Edition* (Institute of Transportation Engineers [ITE], 1997). The No Action Alternative traffic network, therefore, uses the counts taken in July 1997 as a baseline, provides a one percent per year background growth rate, and adds trips to account for these two residential developments (which are expected to be in service by 2002).

LOS Analysis

Capacity analyses and LOS determinations for the No Action Alternative were performed for the intersections considered under existing conditions. Table 4.4-1 compares the results of the No Action Alternative and the existing conditions analyses for the am and pm peaks. Consistent with the one percent annual growth rate and increase in background traffic, operations are expected to worsen slightly in the future.

Public Transportation

The background growth and residential developments are not expected to impact the public transit system.

Parking

Existing parking conditions would be expected to continue under the No Action Alternative.

Table 4.4-1

Summary of LOS Analysis, Existing Conditions and No Action Alternative

Intersection	Existing Conditions		No Action Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Williamsburg Street West and Kent Avenue (Location 2)				
Westbound LTR	B	B	B	B
Northbound L	B	B	B	B
Northbound T	B	B	B	B
Southbound T	B	B	B	B
Overall	B	B	B	B
Classon/Rutledge Street and Kent Avenue (Location 3)				
Eastbound L	B	B	B	B
Eastbound TR	B	B	B	B
Northbound TR	B	B	B	B
Southbound L	B	B	B	B
Southbound T	B	B	B	B
Overall	B	B	B	B
Williamsburg Street West and Flushing Avenue (Location 4)				
Westbound LTR	B	B	B	B
Northbound L	B	C	C	D
Northbound T	B	B	B	B
Southbound TR	B	B	B	B
Overall	B	B	B	C
Classon Avenue and Flushing Avenue (Location 5)				
Eastbound LTR	B	B	B	B
Northbound TR	C	B	C	B
Southbound L	C	B	E	C
Southbound T	C	B	B	B
Overall	B	B	C	B
Flushing Avenue and Clinton Avenue (Location 6)				
Eastbound LTR	A	A	A	A
Westbound LTR	B	A	B	A
Northbound LTR	B	B	B	B
Southbound LTR	B	B	B	B
Overall	B	B	B	B

Table 4.4-1, Continued

Summary of LOS Analysis, Existing Conditions and No Action Alternative

Intersection	Existing Conditions		No Action Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Park Avenue West and Clinton Avenue (Location 7)				
Westbound LTR	B	B	B	B
Northbound L	C	C	C	C
Northbound T	C	C	C	C
Southbound TR	C	C	C	C
Overall	B	B	B	B
Park Avenue East and Clinton Avenue (Location 8)				
Eastbound LTR	B	B	B	B
Northbound TR	C	C	C	C
Southbound LT	C	C	C	C
Overall	B	B	B	B
Clymer Avenue and Kent Avenue (Location 9)				
Eastbound LTR	C	C	C	C
Westbound LTR	C	C	C	C
Northbound L	A	A	A	A
Northbound LT	A	A	A	A
Southbound TR	A	A	A	A
Overall	B	B	B	B
Williamsburg Street West and Wythe Avenue (Location 10)				
Westbound LTR	B	B	B	B
Southbound TR	C	C	C	C
Overall	B	B	B	B
Williamsburg Street East and Wythe Avenue (Location 11)				
Eastbound TR	B	B	C	C
Eastbound R	B	B	B	B
Southbound L	B	B	B	B
Southbound LT	B	B	B	B
Overall	B	B	B	B

Table 4.4-1, Continued

Summary of LOS Analysis, Existing Conditions and No Action Alternative

Intersection	Existing Conditions		No Action Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Park Avenue and Classon Avenue (Location 12)				
Eastbound L	F	F	F	F
Eastbound T	B	B	B	B
Westbound TR	B	B	B	B
Northbound LTR	B	B	B	B
Overall	F	F	F	F
Flushing Avenue and Navy Street (Location 13)				
Eastbound LTR	B	B	B	B
Westbound LTR	B	B	B	B
Northbound LTR	C	C	C	C
Southbound L	C	F	C	F
Southbound TR	C	F	C	C
Overall	B	F	B	F
Park Avenue West and Navy Street (Location 14)				
Westbound LTR	B	B	B	B
Northbound LT	C	C	C	C
Southbound T	C	C	C	C
Overall	B	B	B	B
Park Avenue East and Navy Street (Location 15)				
Eastbound LTR	B	B	B	B
Northbound T	C	C	C	C
Southbound LT	C	C	C	C
Overall	B	B	B	B
Notes: L=Left; T=Through; R=Right				

4.4.2 Reuse Plan

Trip Generation

Site development under the Reuse Plan would provide mixed development of industrial and commercial uses, and is based on the adaptive reuse of existing residential and hospital facilities for community institutional purposes. No new construction would occur at the site; rather, it is proposed that industrial or commercial activity be limited to the renovation of the existing historic buildings. The trips expected to be generated by the Reuse Plan were applied to existing peak hours during the am (6:30 to 9:30) and pm (3:30 to 6:30) commuter peak periods. Trips generated by the proposed development were calculated based on vehicle trip generation rates provided in *Trip Generation, 6th Edition* (ITE, 1997).

Table 4.4-2 provides a summary of the proposed development areas, trip generation rates, and the generated vehicle trips for the am and pm peak periods. The Reuse Plan would generate 1,440 additional trips in the am peak hour and 1,436 additional trips in the pm peak hour. These values are sums of the 'enter' and 'exit' volumes for each peak. Based on ITE trip generation rates, the Reuse Plan would generate 11,222 two-way vehicle trips per day.

Trip Distribution

Distribution of future project-related trips is based on current travel patterns. The access routes assumed for distribution of project-generated trips are shown in Figure 4.4-1 (Vehicle Trip Distribution).

Level of Service Analysis

Capacity analyses were performed for the same intersections considered for existing conditions and the No Action Alternative (See Appendix D). Overall operation at most of the intersections remains acceptable. Certain lane group movements, however, would experience increased delay. Table 4.4-3 presents predicted peak-hour LOS changes between the Reuse Plan and no action conditions. Intersections not presented in this table exhibit no change in LOS. However, minor changes between the two alternatives may exist in the more specialized areas of approximate volume, volume/capacity (V/C) ratio, and stopped delay.

In defining significant impacts at an intersection, the *City Environmental Quality Review Manual*, Section 410, states that stopped vehicle delay should be investigated if there is no LOS change. As a final measure, if stopped delay is incalculable or inconclusive, the V/C ratio may be used. For detailed tables, see Appendix D. A summary of the impacts at each study area intersection follows.

Table 4.4-2

Weekday Generated Vehicle Trips – Reuse Plan

Land Use	Floor Area sq ft (sq m)	ITE Code	Trip Generation Rate				Generated Vehicle Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
			Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Northern Triangle:										
Light Industry	19,700 (1,830)	110	0.91	0.10	0.15	0.93	18	2	3	18
Warehousing	12,300 (1,143)	150	0.34	0.23	0.05	0.56	4	3	1	7
Western Industrial Sector:										
Office Space	129,500 (12,031)	710	1.37	0.19	0.25	1.24	178	24	33	160
High Tech Manufacturing	122,550 (11,385)	140	0.53	0.25	0.39	0.36	65	31	48	44
Research	175,950 (16,346)	760	1.03	0.21	0.16	0.92	181	37	29	162
BQE Frontage:										
Fast Food	4,600 (427)	833	33.02	30.48	26.72	25.68	152	140	123	118
Specialty Retail	4,600 (427)	814	3.08	3.33	2.81	2.12	14	15	13	10
Convenience Market	4,600 (427)	852	16.63	15.97	17.75	18.47	76	73	82	85
Office Space	35,135 (3,264)	710	1.37	0.19	0.25	1.24	48	7	9	43
Pharmacy	3,560 (331)	880	3.74	3.90	4.22	4.40	13	14	15	16
Hospital Campus:										
Day Care Center	7,852 (729)	565	7.16	6.35	6.35	7.39	56	50	51	58
School	84,000 (7,804)	540	1.42	0.36	0.76	0.90	119	30	64	75
Institutional Offices	88,648 (8,235)	730	0.86	0.16	1.41	0.50	76	14	125	44
Total Trips							1,000	440	596	840

Notes: Trip generation rates rounded to the nearest 0.01.
Source: *Trip Generation, 6th Edition* (ITE, 1997)

Vehicle Trip Distribution

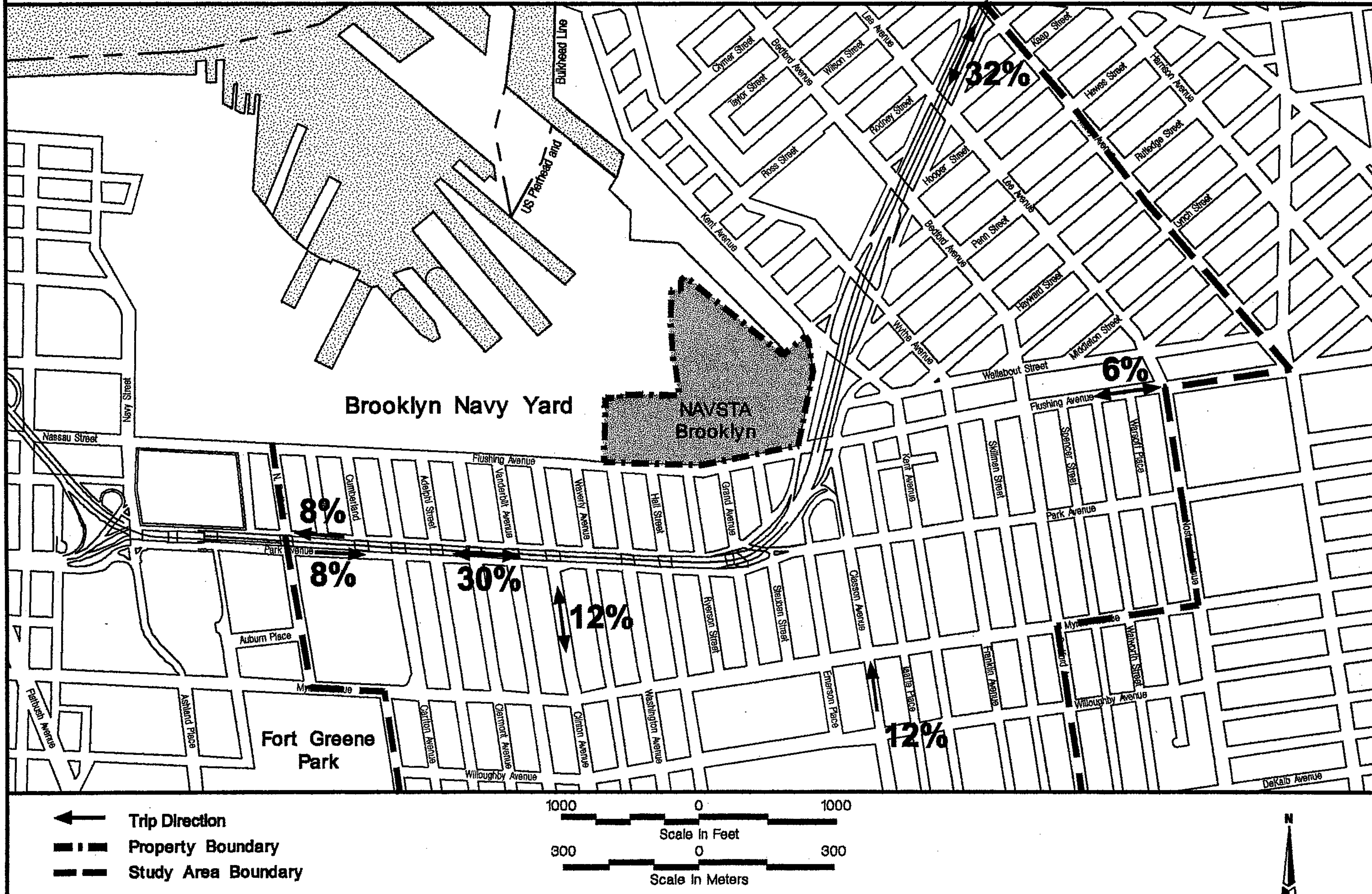


Figure 4.4-1

Table 4.4-3

Summary of LOS Analysis, No Action Alternative and Reuse Plan

Intersection	No Action Alternative		Reuse Plan	
	AM Peak	PM Peak	AM Peak	PM Peak
Williamsburg Street West and Kent Avenue (Location 2)				
Westbound LTR	B	B	B	B
Northbound L	B	B	B	C
Northbound T	B	B	B	B
Southbound T	B	B	B	B
Overall	B	B	B	B
Williamsburg Street West and Flushing Avenue (Location 4)				
Westbound LTR	B	B	C	B
Northbound L	C	D	E	F
Northbound T	B	B	E	B
Southbound TR	B	B	B	B
Overall	B	C	D	F
Classon Avenue and Flushing Avenue (Location 5)				
Eastbound LTR	B	B	C	C
Northbound TR	C	B	C	B
Southbound L	E	C	F	F
Southbound T	B	B	B	B
Overall	C	B	F	F
Flushing Avenue and Clinton Avenue (Location 6)				
Eastbound LTR	A	A	A	A
Westbound LTR	B	A	B	E
Northbound LTR	B	B	B	B
Southbound LTR	B	B	B	B
Overall	B	B	B	D
Notes: L=Left, T=Through, R=Right				

- Williamsburg Street East and Kent Avenue (Location 1) – The difficulties surrounding the analysis of this location are detailed in Subchapter 3.4. Traffic operations at this intersection are dictated by operation at Locations 2 and 3.

- Williamsburg Street West and Kent Avenue (Location 2) – Although the Reuse Plan would cause a significant increase in traffic volume through this intersection (southbound on Kent Avenue, and on Williamsburg Street West/BQE access), LOS would remain consistent (at LOS B overall) for the am and pm peaks.

- Classon/Rutledge Street and Kent Avenue (Location 3) – The Reuse Plan-related 14 percent increase in vehicles turning left from Classon Street to Kent Avenue (from 789 to 899, am peak) would cause only a minimal impact. The overall intersection delay would increase from 12.3 to 12.6 seconds per vehicle, while the intersection would remain at a favorable LOS B operation.

- Williamsburg Street West and Flushing Avenue (Location 4) – The trips potentially generated during the am peak by the Reuse Plan indicate minimal impacts on the intersection. However, during the pm peak, a significant increase in northbound traffic on Flushing Avenue would result in LOS F operation for left-turning traffic and for overall operation.

- Classon Avenue and Flushing Avenue (Location 5) – The effect of the Reuse Plan would be significant for both the am and pm peaks. An increase in southbound left-turning vehicles (from Flushing onto Williamsburg Street East) would result in LOS F for this movement and overall LOS F operation.

- Flushing Avenue and Clinton Avenue (Location 6) – Overall operations are expected to remain consistent (LOS B) for the am peak, and acceptable for the pm peak (LOS B degrades to LOS D) despite increased Reuse Plan-related traffic on Flushing Avenue.

- Park Avenue West and Clinton Avenue (Location 7) – Overall operations are expected to remain similar to the No Action Alternative (LOS B, for the am peak). During the pm peak the WB approach degrades to LOS E and the overall operation degrades from LOS B to D.

- Park Avenue East and Clinton Avenue (Location 8) – Overall operations are expected to remain acceptable (LOS B, both peaks) under the Reuse Plan despite the anticipated increase in through traffic on Clinton Avenue.

- Clymer Avenue and Kent Avenue (Location 9) – No additional trips would be surcharged onto this intersection; therefore, overall operations are expected to remain at LOS B for both am and pm peaks.

- Williamsburg Street West and Wythe Avenue (Location 10) – Overall operations are expected to remain acceptable (LOS B, both peaks) under the Reuse Plan, despite the anticipated increase in through traffic on Williamsburg Street West.

- Williamsburg Street East and Wythe Avenue (Location 11) – Overall operations are expected to remain acceptable (LOS B, both peaks) under the Reuse Plan, despite the anticipated increase in through traffic on Williamsburg Street East.

- Park Avenue and Classon Avenue (Location 12) – During the am peak, the high volume of left-turning vehicles in the eastbound direction continue to operate at LOS F, as under no action conditions, so that the intersection would operate at an overall LOS F, similar to no action conditions.

- Flushing Avenue and Navy Street (Location 13) – Additional southbound left-turning vehicles on Navy Street, combined with additional opposing traffic in the northbound direction, would cause the southbound movement to fail in the pm peak under the Reuse Plan. All other intersection approaches would maintain LOS operation similar to that proposed under no action conditions. Overall operation of the intersection would be LOS B in the am peak, and LOS F in the pm peak.

- Park Avenue West and Navy Street (Location 14) – The expected Reuse Plan-related increase in Park Avenue traffic volume would be slight, and would not introduce any significant impacts, as the am and pm peaks would remain acceptable (overall LOS B).

- Park Avenue East and Navy Street (Location 15) – The expected Reuse Plan-related increase in Park Avenue traffic volume would be slight, and would not introduce any significant impacts, as the am and pm peaks would remain acceptable (overall LOS B).

In summary, the additional trips generated by the Reuse Plan would result in varying impacts to traffic operations during the commuter peak periods. Most intersections would operate at an acceptable overall LOS (C or better); however, three locations would experience significant impacts:

- Williamsburg Street West and Flushing Avenue (am and pm peak);
- Classon Avenue and Flushing Avenue (am and pm peaks); and
- Flushing Avenue and Clinton Avenue (pm peak).

Public Transportation

The Reuse Plan is not anticipated to introduce any significant impacts to the public transportation system.

Parking

The Reuse Plan is anticipated to generate employment of about 1,600 employees (Table 4.2-1). The zoning requirements provide for 800 on-site parking spaces that are provided for in the land use program (Table 2-3). The trip generation rates projected for the Reuse Plan (Table 4.4-2) are based on the *Trip Generation, 6th Edition* (ITE, 1997) and are conservative in the context of New York City (i.e., assume higher number of vehicle trips per worker). During the am peak, 1,000 vehicle trips are expected, of which about 300 are associated with the retail activities on the BQE Frontage; the great majority of these would not be commuters. Similarly, a substantial proportion of trips associated with the Hospital Campus institutional activities (day care, school, etc.) would be dropping-off passengers rather than commuter parking. The zoning requirements for on-site commuter parking are considered adequate and are provided for in the Reuse Plan.

Some increase in demand for on-street parking would also occur in the vicinity of NAVSTA Brooklyn under the Reuse Plan, however, given the existing limited available capacity, conditions are not expected to alter.

4.4.3 Residential Alternative

Trip Generation, Distribution, and Level of Service Analysis

This alternative provides a less-intensive development scenario. The northern triangle, western industrial sector, and BQE frontage would be developed with the same land uses and areas as the Reuse Plan. Therefore, the generated vehicle trips are constant within these sectors. Within the hospital campus, however, the Residential Alternative land use has a 15-unit single-family detached housing complex and 79-unit apartment complex.

A summary of anticipated weekday trips generated under the Residential Alternative is provided in Table 4.4-4. Compared to the No Action Alternative, the Residential Alternative would generate 1,151 additional trips in the am peak hour and 1,088 additional trips in the pm peak hour. Based on ITE trip generation rates, the Residential Alternative would generate 8,664 two-way vehicle trips per day.

Table 4.4-4

Weekday Generated Vehicle Trips – Residential Alternative

Land Use	Floor Area sq ft (sq m)	ITE Code	Trip Generation Rate				Generated Vehicle Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
			Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Northern Triangle:										
Light Industry	19,700 (1,830)	110	0.91	0.10	0.15	0.93	18	2	3	18
Warehousing	12,300 (1,143)	150	0.34	0.23	0.05	0.56	4	3	1	7
Western Industrial Sector:										
Office Space	129,500 (12,031)	710	1.37	0.19	0.25	1.24	178	24	33	160
High-Tech Manufacturing	122,550 (11,385)	140	0.53	0.25	0.39	0.36	65	31	48	44
Research	175,950 (16,346)	760	1.03	0.21	0.16	0.92	181	37	29	162
BQE Frontage:										
Fast Food	4,600 (427)	833	33.02	30.48	26.72	25.68	152	140	123	118
Specialty Retail	4,600 (427)	814	3.08	3.33	2.81	2.12	14	15	13	10
Convenience Market	4,600 (427)	852	16.63	15.97	17.75	18.47	76	73	82	85
Office Space	35,135 (3,264)	710	1.37	0.19	0.25	1.24	48	7	9	43
Pharmacy	3,560 (331)	880	3.74	3.90	4.22	4.40	13	14	15	16
Hospital Campus:										
Single Family Detached	15 units	210	0.19	0.58	0.65	0.37	3	9	10	6
Apartment	79 units	220	0.16	0.40	0.41	0.26	12	32	32	21
Total Trips							764	387	398	690

Notes: Trip generation rates rounded to the nearest 0.01.
Source: *Trip Generation, 6th Edition* (ITE, 1997)

The lower-intensity development under the Residential Alternative indicates that the surrounding street network would operate at an overall LOS superior to that discussed for the Reuse Plan. However, two of the intersections that exhibited significant impacts under the Reuse Plan would also be significantly impacted under this alternative: Location 4 (Williamsburg Street West and Flushing Avenue) and Location 5 (Classon Avenue and Flushing Avenue). Table 4.4-5 presents predicted peak-hour LOS changes between the Residential Alternative and no action conditions. Intersections not presented in this table exhibit no change in LOS. However, minor changes between the two alternatives may exist in the more specialized areas of approximate volume, V/C ratio, and stopped delay. For detailed tables, see Appendix D.

Public Transportation

The Residential Alternative would not introduce significant impacts to the public transportation system.

Parking

The Residential Alternative would generate an estimated 1,050 employees (Table 4.2-7), or 64 percent of the Reuse Plan's employment. However, zoning requirements result in a land use program that provides for 810 parking spaces (Table 2-4), slightly more than the Reuse Plan. Trip generation in the am peak is projected to be 764, of which about 300 is again associated with the BQE Frontage retail activity. As with the Reuse Plan, on site parking for commuters is considered adequate while on-street day-time parking will remain difficult for commuters.

4.4.4 Museum Alternative

Trip Generation, Distribution, and Level of Service Analysis

The Museum Alternative would provide a less-intensive development scenario than the Reuse Plan. Development of the northern triangle and western industrial sector would remain identical to the Reuse Plan; however, the BQE frontage and campus areas would be developed as a museum. The museum is expected to generate 200,000 visitors per year by bus. Assuming the museum is open six days per week, and assuming 32 persons per bus, 20 daily bus trips would be generated. A summary of the generated weekday trips for this alternative is provided in Table 4.4-6, which indicates that 549 and 511 additional trips would generated during the am and pm peak hours, respectively. Based on ITE trip generation rates, the Museum Alternative would generate 2,468 two-way vehicle trips per day.

Table 4.4-5

Summary of LOS Analysis, No Action and Residential Alternatives

Intersection	No Action Alternative		Residential Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Williamsburg Street West and Kent Avenue (Location 2)				
Westbound LTR	B	B	B	B
Northbound L	B	B	B	C
Northbound T	B	B	B	B
Southbound T	B	B	B	B
Overall	B	B	B	B
Williamsburg Street West and Flushing Avenue (Location 4)				
Westbound LTR	B	B	C	B
Northbound L	C	D	D	F
Northbound T	B	B	D	B
Southbound TR	B	B	B	B
Overall	B	C	C	F
Classon Avenue and Flushing Avenue (Location 5)				
Eastbound LTR	B	B	C	C
Northbound TR	C	B	C	B
Southbound L	E	C	F	F
Southbound T	B	B	B	B
Overall	C	B	F	F
Flushing Avenue and Clinton Avenue (Location 6)				
Eastbound LTR	A	A	A	A
Westbound LTR	B	A	B	C
Northbound LTR	B	B	B	B
Southbound LTR	B	B	B	B
Overall	B	B	B	B
Notes: L = Left, T = Through, R = Right				

Table 4.4-6

Weekday Generated Vehicle Trips – Museum Alternative

Land Use	Floor Area sq ft (sq m)	ITE Code	Trip Generation Rate				Generated Vehicle Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
			Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Northern Triangle:										
Light Industry	19,700 (1,830)	110	0.91	0.10	0.15	0.93	18	2	3	18
Warehousing	12,300 (1,143)	150	0.34	0.23	0.05	0.56	4	3	1	7
Western Industrial Sector:										
Office Space	129,500 (12,031)	710	1.37	0.19	0.25	1.24	178	24	33	160
High Tech Manufacturing	122,550 (11,385)	140	0.53	0.25	0.39	0.36	65	31	48	44
Research	175,950 (16,346)	760	1.03	0.21	0.16	0.92	181	37	29	162
BQE Frontage & Hospital Campus	*estimated* 200,000 visitors per year						6	0	0	6
Total Trips							452	97	114	397

Notes: Trip generation rates rounded to the nearest 0.01.
Source: *Trip Generation, 6th Edition (ITE, 1997)*

Table 4.4-7 presents predicted peak-hour LOS changes between the Museum Alternative and no action conditions. Intersections not presented in this table exhibit no change in LOS. However, minor changes between the two alternatives may exist in the more specialized areas of approximate volume, V/C ratio, and stopped delay. For detailed tables, see Appendix D. As expected, the Museum Alternative would not have as significant an impact on the surrounding street network as the Reuse Plan.

Public Transportation and Parking

The Museum Alternative would have fewer employees than the Reuse Plan and is not expected to have an adverse impact on public transportation. The great majority of visitors to the Museum element would arrive by private bus. Zoning for the C2-6 district proposed for the museum portion of the site does not require on-site parking (Chapter 4.1.4). However, 800 parking spaces are provided under the proposed land use program (Table 2-5).These spaces are expected to be sufficient to accommodate the employees and typical numbers of busses generated. On-street parking will remain difficult to find in the area for commuters but may be possible for some short-term visitors.

4.4.5 As-of-Right Alternative

Trip Generation, Distribution, and Level of Service Analysis

The As-of-Right Alternative assumes a maximum building condition. Previously broken into four sections (northern triangle, western industrial sector, BQE frontage, and hospital campus), the site is analyzed here as a single "study area." Under this alternative, there are 1.2 million sq ft (111,500 sq m) of light industry and approximately 1.3 million sq ft (121,000 sq m) of warehousing proposed. As a result of this buildout, there would be a significant increase in trips generated by entering vehicles during the am peak hour, and exiting vehicles during the pm peak hour, when compared to the Reuse Plan. The As-of-Right Alternative would generate an additional 1,960 and 2,096 vehicle trips during the am and pm peak hours, respectively. A summary of the generated weekday trips for this alternative is provided in Table 4.4-8. Based on ITE trip generation rates, the As-of-Right Alternative would generate 14,888 two-way vehicle trips per day.

Although this alternative generates the greatest number of vehicle trips, its impacts are not significantly greater than impacts under the other alternatives. While delay would increase on certain approaches, the LOS would not degrade beyond that of other alternatives. Table 4.4-9 presents predicted peak-hour LOS changes between the As-of-Right Alternative and no action conditions. Intersections not presented in this table exhibit no change in LOS. However, minor changes between the two alternatives may exist in the more specialized areas of approximate volume, V/C ratio, and stopped delay. For detailed tables, see Appendix D.

Table 4.4-7

Summary of LOS Analysis, No Action and Museum Alternatives

Intersection	No Action Alternative		Museum Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Williamsburg Street West and Flushing Avenue (Location 4)				
Westbound LTR	B	B	B	B
Northbound L	C	D	C	F
Northbound T	B	B	C	B
Southbound TR	B	B	B	B
Overall	B	C	B	F
Classon Avenue and Flushing Avenue (Location 5)				
Eastbound LTR	B	B	B	B
Northbound TR	C	B	C	B
Southbound L	E	C	F	F
Southbound T	B	B	B	B
Overall	C	B	F	F
Flushing Avenue and Clinton Avenue (Location 6)				
Eastbound LTR	A	A	A	A
Westbound LTR	B	A	B	B
Northbound LTR	B	B	B	B
Southbound LTR	B	B	B	B
Overall	B	B	B	B
Williamsburg Street East and Wythe Avenue (Location 11)				
Eastbound LTR	C	C	C	B
Eastbound R	B	B	B	B
Southbound L	B	B	B	B
Southbound LT	B	B	B	B
Overall	B	B	B	B

Notes: L = Left; T = Through; R = Right

Table 4.4-8

Weekday Generated Vehicle Trips – As-of-Right Alternative

Land Use	Floor Area sq ft (sq m)	ITE Code	Trip Generation Rate				Generated Vehicle Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
			Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Study Area										
Light Industry	1,200,000 (111,500)	110	0.91	0.10	0.15	0.93	1,092	120	180	1,115
Warehousing	1,313,000 (121,000)	150	0.34	0.23	0.05	0.56	441	307	64	737
Total Trips							1,533	427	244	1,852

Notes: Trip Generation rates rounded to the nearest 0.01.
Source: *Trip Generation, 6th Edition (ITE, 1997)*

Table 4.4-9

Summary of LOS Analysis, No Action and As-of-Right Alternatives

Intersection	No Action Alternative		As-of-Right Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Williamsburg Street West and Kent Avenue (Location 2)				
Westbound LTR	B	B	B	B
Northbound L	B	B	B	C
Northbound T	B	B	B	B
Southbound T	B	B	B	B
Overall	B	B	B	B
Classon/Rutledge Street and Kent Avenue (Location 3)				
Eastbound L	B	B	B	C
Eastbound LTR	B	B	B	B
Northbound TR	B	B	B	B
Southbound L	B	B	B	B
Southbound T	B	B	B	B
Overall	B	B	B	B
Williamsburg Street West and Flushing Avenue (Location 4)				
Westbound LTR	B	B	C	B
Northbound L	C	D	F	F
Northbound T	B	B	F	B
Southbound TR	B	B	B	D
Overall	B	C	F	F
Classon Avenue and Flushing Avenue (Location 5)				
Eastbound LTR	B	B	C	B
Northbound TR	C	B	C	B
Southbound L	E	C	F	F
Southbound T	B	B	B	B
Overall	C	B	F	F
Flushing Avenue and Clinton Avenue (Location 6)				
Eastbound LTR	A	A	A	A
Westbound LTR	B	A	B	F
Northbound LTR	B	B	B	B
Southbound LTR	B	B	B	B
Overall	B	B	B	F

Table 4.4-9, Continued

Summary of LOS Analysis, No Action and As-of-Right Alternatives

Intersection	No Action Alternative		As-of-Right Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Park Avenue West and Clinton Avenue (Location 7)				
Westbound LTR	B	B	B	B
Northbound L	C	C	C	D
Northbound T	C	C	C	D
Southbound TR	C	C	C	C
Overall	B	B	B	F
Park Avenue East and Clinton Avenue (Location 8)				
Eastbound LTR	B	B	B	B
Northbound TR	C	C	C	C
Southbound LT	C	C	C	D
Overall	B	B	B	B
Williamsburg Street East and Wythe Avenue (Location 11)				
Eastbound LTR	C	C	C	C
Eastbound R	B	B	B	B
Southbound L	B	B	B	B
Southbound LT	B	B	B	B
Overall	B	B	B	C
Notes: L = Left; T = Through; R = Right				

Public Transportation and Parking

The As-of-Right Alternative is estimated to generate 5,000 employees (Table 4.2-13) and the land use program under this alternative provides 1,250 parking spaces (Table 2-6), as required under existing M3 zoning. Public transportation in the area is not expected to be significantly impacted. On-street parking is not expected to serve the commuting workers and so would not be significantly affected.

4.5 Air Quality

4.5.1 No Action Alternative

Mobile Sources

The purpose of performing a carbon monoxide (CO) modeling analysis is to evaluate traffic-related air quality conditions under the No Action Alternative for comparison with the Reuse Plan and other action alternatives. Average hourly CO concentrations were predicted for the peak am and pm traffic periods using the computer modeling process described in Subchapter 3.5.2.

The CO concentrations were analyzed at the same receptor locations used in the study of the existing conditions. The worst-case results for the No Action Alternative in the year 2002 show no violations of the NAAQS CO one-hour standard of 35 ppm and eight-hour standard of nine ppm (Table 4.5-1). Although an increase in traffic is predicted due to regional growth, the results indicate CO levels less than those under existing conditions as a result from a decrease in per vehicle emissions due to compliance with the federal vehicle emission control program.

Stationary Sources

Under the No Action Alternative, NAVSTA Brooklyn would remain closed and no activities would occur at the project site. Therefore, stationary source air emissions at the site would remain at their existing minimum level. Furthermore, the major off-site stationary sources would not have any impact on the site since no land use development would occur at the project location.

4.5.2 Reuse Plan

Mobile Sources

Utilizing the same modeling techniques described in Subchapter 3.5.2, the results of the CO impact analysis for the Reuse Plan in the year 2002 show no violations of the NAAQS CO one-hour standard of 35 ppm and eight-hour standard of nine ppm. The worst-case CO impacts are presented in Table 4.5-1. CO levels under the Reuse Plan are predicted to be higher than those under the No Action Alternative due to an increase in traffic attributable to the Reuse Plan. However, the increase would not be significant.

Table 4.5-1

Weekday Peak Carbon Monoxide Levels
for No Action Alternative and Reuse Plan (Year 2002)

Location	One-Hour Concentration (ppm)		Eight-Hour Concentration (ppm)	
	No Action Alternative	Reuse Plan	No Action Alternative	Reuse Plan
Park Avenue East /Park Avenue West and Clinton Avenue	5.1	5.6	3.4	3.7
Kent Avenue and Clymer Street	4.4	4.4	2.9	2.9
Kent Avenue and Williamsburg Street West	5.2	5.3	3.4	3.5
Williamsburg Street East/Williamsburg Street West and Wythe Avenue	5.3	5.4	3.5	3.8
Williamsburg Street West and Flushing Avenue	5.4	5.8	3.6	3.9
Flushing Avenue and Navy Street	5.5	5.5	3.6	3.6
Park Avenue East/Park Avenue West and Navy Street	5.5	5.5	3.6	3.6

Notes: CO levels include background concentrations of 3.3 ppm (one-hour) and 2.1 ppm (eight-hour). CO one-hour standard is 35 ppm: CO eight-hour standard is nine ppm.

Stationary Sources

Off-site air quality impacts may arise when a proposed action creates a new major stationary source on site. In addition, if a project site were developed into sensitive land uses, such as residential uses, existing off-site major stationary sources could result in potential air quality impacts on the new sensitive land uses on site. Therefore, in this study, potential stationary source air quality impacts were evaluated for the following:

- Off-site impact resulting from the on-site sources; and
- On-site impact resulting from the off-site major sources.

On-Site Emission Sources

Under the Reuse Plan, the on-site existing buildings would be renovated and no new building construction is proposed. The renovation would likely involve installation of space-heating boiler in each of these reuse buildings. The project area is located in an area that is severe nonattainment for ozone (NO_x and VOC are the precursors) and moderate nonattainment for CO. For these nonattainment areas, a source is considered major when its emissions exceed 25 tons per year (tpy) of NO_x or VOC and 100 tpy of CO. Based on an estimate of building area described in Chapter 2 (a total of 657,200 sq ft [61,100 sq m]) and the typical annual heating value (96,400 BTU/ft^2) provided in Table 3N-1 of the CEQR (NYCDEP, 1993), the boiler-related emissions were estimated as follows:

- 11.6 tpy for NO_x;
- 0.2 tpy for VOC; and
- 1.1 tpy for CO.

These emissions were calculated using uncontrolled No.6 fuel oil emission factors and therefore they are very conservative. These space-heating boilers would be minor and would have minimal off-site impact.

Given the limited information at this planning stage regarding potential future industrial operations, the emission types and levels of such stationary sources cannot be determined at this time. However, any major new stationary sources would need to be operated by facility owners in compliance with air permit regulations established in the NYS Part 201 regulations (NYSDEC, 1998) and the NYC Air Pollution Control Code (NYCDEP, 1998). Thus, there would be no significant air quality impact from industrial operations.

Major Off-Site Emission Sources

Two major stationary sources are located relatively close (i.e., within an approximately 4,260-ft [1,300 m] radius) of the project site (Figure 4.5-1, Air Emission Source Locations):

- A Con Edison (Con Ed) power plant approximately 4,260 ft (1,300 m) to the northwest of the project site; and
- The Brooklyn Navy Yard Cogen Plant (BNYCP) approximately 3,100 ft (950 m) from the project site.

These two major stationary sources are currently operated under air permits issued by the NYSDEC. Potential air quality impacts from their air emissions were evaluated and are discussed in detail in Appendix E.

The ambient concentration levels for each pollutant were predicted for the applicable averaging periods using the USEPA-approved dispersion model in association with the five-year meteorological data obtained at LaGuardia Airport. The dispersion model ISCST3 (version 97363) was used in this analysis. The model options and source parameters employed are detailed in Appendix E.

A total of 100 grid receptor locations with 164-ft (50-m) horizontal spacing were placed on site (Figure 4.5-2, Receptor Grid), covering the entire project area. The highest elevation of the tallest on-site building is about 75 ft (23 m); therefore, in order to determine the potential plume impact on elevated sensitive locations, a total of 30 additional discrete receptors were placed at various elevations from 25 ft (7.6 m) to 75 ft (23 m) with a 25-ft (7.6-m) vertical spacing.

The worst-case total concentrations at the modeled receptor locations are presented in Table 4.5-2. These total concentrations consist of the impact concentrations predicted by the dispersion model and the background concentrations resulting from other background stationary and mobile sources. Due to their proximity to the site and relevant land uses, the background concentration levels were determined based on the latest available ambient air quality data recorded through NYSDEC monitoring at the most representative sites for this project. No exceedances of the NAAQS were predicted to occur on site due to off-site major sources.

Air Emission Source Locations

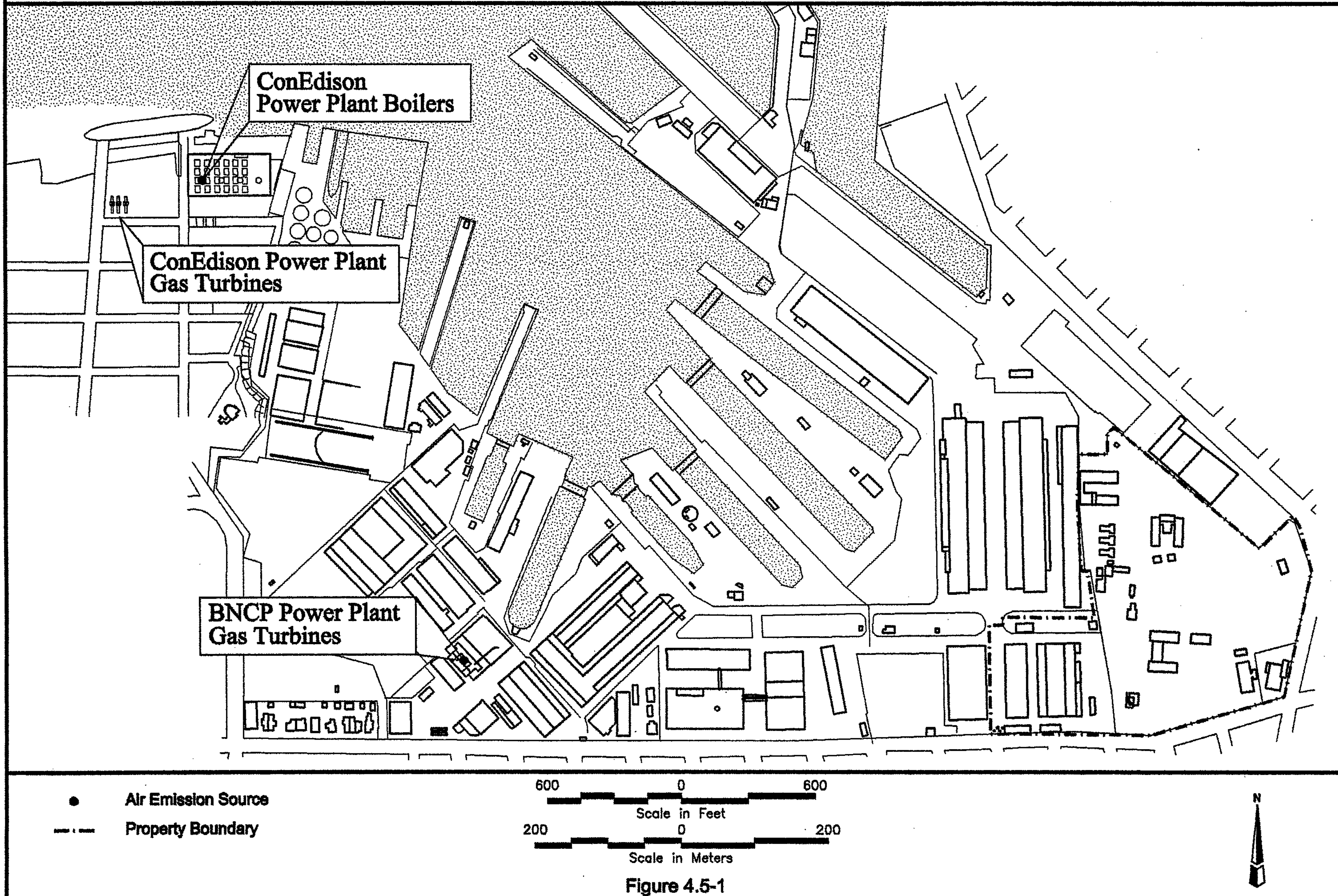


Figure 4.5-1

Receptor Grid

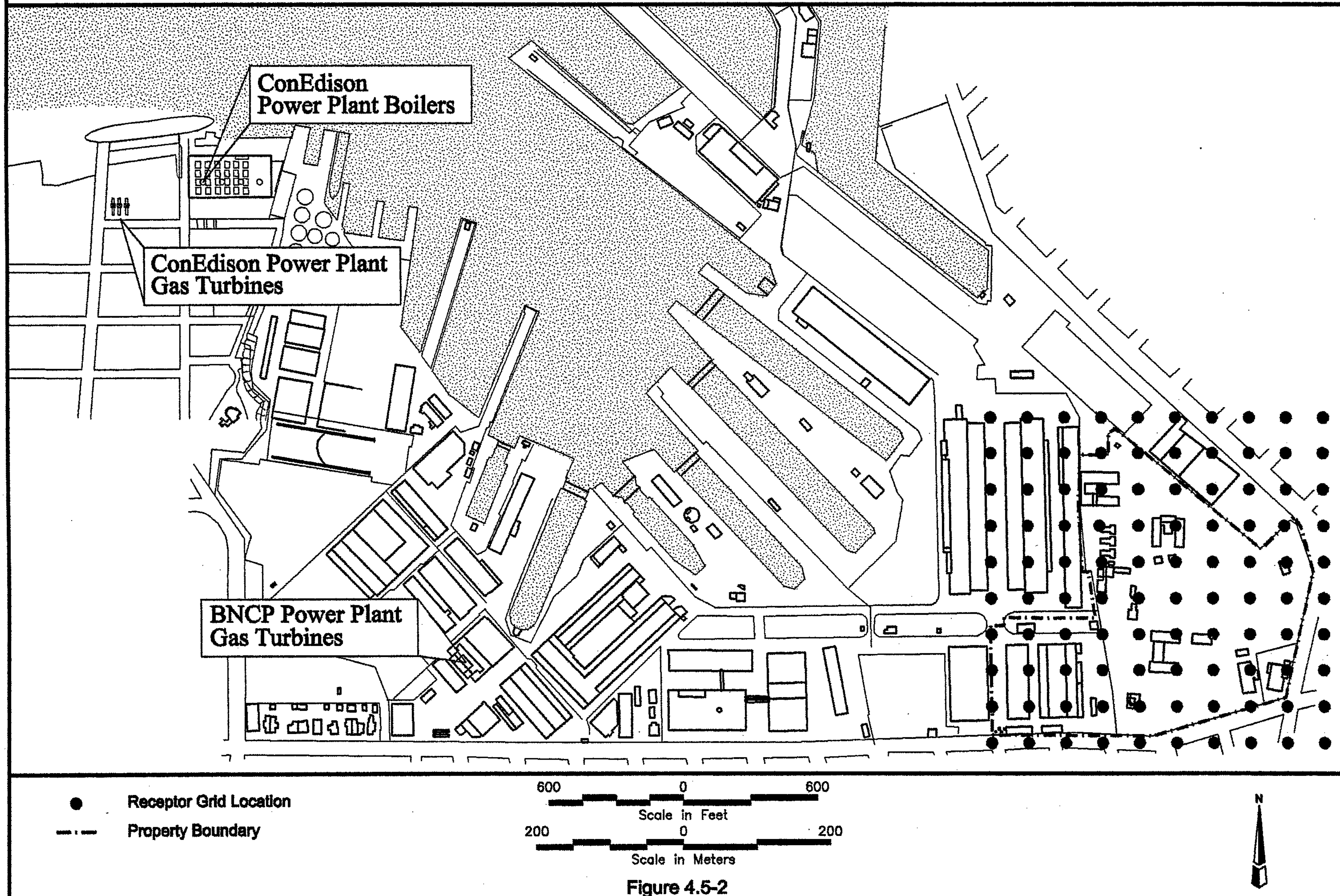


Figure 4.5-2

Table 4.5-2

Worst-Case Total Concentration

Pollutant/ Averaging Time	Background Concentration	Con Ed and BNYCP Impact *	Total Impact	NAAQS
CO -				
8-hour	3,000	7	3,007	10,000
1-hour	4,229	14	4,243	40,000
NO_2 - Annual Arithmetic Mean	65	8	73	100
PM10 -				
Annual Arithmetic Mean	26	2	28	50
Second Highest 24-hour	64	11	75	150
TSP -				
Annual Geometric Mean	58	2	60	75
Second Highest 24-hour	98	11	109	250
SO_2 -				
Annual Arithmetic Mean	29	5	34	80
Second Highest 24-hour	134	38	172	365
Second Highest 3-hour	231	74	305	1,300

Notes: All concentrations are in micrograms per cubic meter of air.
Background levels are obtained from 1997 Annual New York State Air Quality Report (NYSDEC, July 1998) and from NYCDEP (NYCDEP, October 2, 1998).
* Worst-case receptor concentrations.

4.5.3 Residential and Museum Alternatives

Mobile Sources

Under these two alternatives, the traffic volumes would be the same or less than those under the Reuse Plan. The CO concentrations under the Residential and Museum Alternatives would be equivalent to or less than the CO levels of the Reuse Plan (Table 4.5-1). Therefore, no violations of the NAAQS CO one-hour standard of 35 ppm and eight-hour standard of nine ppm would occur under either alternative.

Stationary Sources

Under these two alternatives, existing structures would be renovated as with the Reuse Plan; therefore, the off-site impacts from on-site emission sources would be similar to the Reuse Plan and would not be significant. Any on-site new stationary sources resulting from industrial operations would have to be constructed and operated in compliance with federal, state, and city air permitting regulations to ensure no significant adverse air quality impact would occur in the project area.

The worst-case on-site impact from off-site major emission sources would be similar to the Reuse Plan since the modeled on-site receptor grid, including ground-level and elevated receptors described for the Reuse Plan, was developed to cover all areas within the property boundary. No exceedances of the NAAQS would occur on site.

However, the stationary source modeling described above considered only those permitted major sources in the neighborhood. If the Residential Alternative were selected for reuse, a more detailed modeling analysis including other minor emission sources may be necessary.

4.5.4 As-of-Right Alternative

Mobile Sources

Utilizing the modeling assumptions described in Subchapter 3.5.2, the results of the modeling analysis for the As-of-Right Alternative show no violations of the CO one-hour standard of 35 ppm and eight-hour standard of nine ppm. The worst-case CO impacts are presented in Table 4.5-3. The CO levels under the As-of-Right Alternative are predicted to be higher than those under the No Action Alternative and the Reuse Plan due to an increase in traffic attributable to the alternative. However, these increases would not be significant.

Table 4.5-3

Weekday Peak Carbon Monoxide Levels
for No Action and As-of-Right Alternatives (Year 2002)

Location	One-Hour Concentration (ppm)		Eight-Hour Concentration (ppm)	
	No Action	As-of-Right	No Action	As-of-Right
Park Avenue East /Park Avenue West and Clinton Avenue	5.1	5.9	3.4	3.9
Kent Avenue and Clymer Street	4.4	4.4	2.9	2.9
Kent Avenue and Williamsburg Street West	5.2	5.4	3.4	3.6
Williamsburg Street East/Williamsburg Street West and Wythe Avenue	5.3	5.7	3.5	3.8
Williamsburg Street West and Flushing Avenue	5.4	6.1	3.6	4.1
Flushing Avenue and Navy Street	5.5	5.5	3.6	3.6
Park Avenue East/Park Avenue West and Navy Street	5.5	5.7	3.6	3.8

Notes: CO levels include background concentrations of 3.3 ppm (one-hour) and 2.1 ppm (eight-hour). CO one-hour standard is 35 ppm; CO eight-hour standard is 9 ppm.

Stationary Sources

Some additional space-heating boilers would be needed for new buildings proposed under this alternative; however, these boilers would be minor sources as discussed for the Reuse Plan. Any new stationary sources resulting from new industrial operations would be constructed and operated in compliance with federal, state, and city air permitting regulations to ensure no significant adverse air quality impact would occur in the project area.

The off-site major emission sources impact would be the same as the Reuse Plan. No exceedances of the NAAQS would occur on site.

4.6 Noise

Human response to changes in noise levels depends on many factors, including the quality of sound, the magnitude of the changes, the time of day at which the changes take place, whether the noise is continuous or intermittent, and the individual's ability to perceive the changes. Human ability to perceive changes in noise levels varies widely from person to person, as does response to the perceived changes. However, the average ability of an individual to perceive changes in noise levels is well-documented (Table 4.6-1).

Table 4.6-1

Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A "dramatic change"
40	Difference between a faintly audible sound and a very loud sound
Source: FHWA, June 1995.	

Generally, a three dBA (A-weighted decibel) or smaller change in noise levels would be barely perceptible to most listeners, whereas a ten dBA change is normally perceived as a doubling (or halving) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels. According to the NYC CEPO-CEQR Noise Exposure Standards described in Subchapter 3.6, a three dBA noise increase is considered an indicator of noise impact significance when the daytime level is at or above 62 dBA.

4.6.1 No Action Alternative

The methodology for predicting future noise levels is based on the assumption that existing noise levels are dominated by, and are a function of, existing traffic volumes, and that future noise levels can be determined based on the proportional increase in traffic associated with a project. For example, if the existing volume on a street is 100 vehicles per hour (vph), and the future volume were increased by 50 vph for a total of 150 vph, the noise levels would increase by approximately 1.8 dBA. If future traffic were increased by 100 vph to a total of 200 vph, noise levels would increase by three dBA.

Predicted noise levels for the No Action Alternative for the year 2002 are presented in Table 4.6-2, and are based on the traffic analyses presented in Subchapter 4.4. All increases in noise levels from existing conditions to the No Action Alternative are less than or equal to one dBA.

4.6.2 Reuse Plan

Mobile Sources

Changes in noise levels due to implementation of the Reuse Plan were determined by adding the noise attributable to development-generated traffic to noise levels previously calculated for the No Action Alternative. Table 4.6-2 presents the results of the analysis, which show that there would be no increase of three dBA or greater in traffic noise levels at all monitoring sites except Site 7 (a three dBA or greater change in noise levels becomes perceptible to most listeners and is considered significant in a city environment). Site 7 is the Steuben Playground, a hard-surfaced ball court located across Flushing Avenue from the site and adjacent to the Brooklyn-Queens Expressway (BQE). It would experience a 3.2 dBA increase during the am peak period to traffic merging near the site. An increase in excess of three dBA is a significant impact under NYC standards (Local Laws of the City of New York. Section 24-202 - Environmental Protection and Utilities. Ch 2 on Noise Control. 1993; and as promulgated under NYC DEP *Noise Code*, 1998).

Stationary Sources

Any exterior mechanical equipment (e.g., fans and compressors) would be designed to comply with the NYCDEP *Noise Code* (March 1998); thus, noise levels from such mechanical equipment would not be significant.

Construction Impacts

Construction activities associated with this alternative would include noise from construction/delivery vehicles traveling to and from the site. However, these construction activities would be limited to renovations to building interiors, and noise impacts from interior renovations would be minimal.

4.6.3 Residential and Museum Alternatives

In general, future mobile source noise impacts associated with the these two alternatives would be at similar levels to the Reuse Plan, although somewhat lower given the slightly reduced level of trip

Table 4.6-2

Predicted Noise Levels for No Action Alternative and Reuse Plan

Site	Hour	Noise Level (L_{eq} in dBA)		
		No Action Alternative	Reuse Plan	Net Change
1	AM Peak	62.5	62.5	0.0
	Midday Peak	61.3	61.3	0.0
	PM Peak	63.2	63.2	0.0
	Pre midnight	59.8	59.8	0.0
	24-Hour L_{eq}	60.4	60.4	0.0
	L_{dn}	64.6	64.6	0.0
2	AM Peak	69.5	69.8	0.3
	Midday Peak	70.2	70.5	0.3
	PM Peak	70.6	70.9	0.3
	Pre midnight	64.2	64.4	0.2
	24-Hour L_{eq}	68.9	69.1	0.2
	L_{dn}	72.4	72.6	0.2
3	AM Peak	64.3	64.3	0.0
	Midday Peak	65.2	65.2	0.0
	PM Peak	64.8	64.8	0.0
	Pre midnight	61.3	61.3	0.0
	24-Hour L_{eq}	63.3	63.3	0.0
	L_{dn}	66.9	66.9	0.0
4	AM Peak	70.1	70.1	0.0
	Midday Peak	69.6	69.6	0.0
	PM Peak	67.9	67.9	0.0
	Pre midnight	67.0	67.0	0.0
	24-Hour L_{eq}	67.8	67.8	0.0
	L_{dn}	72.2	72.2	0.0
5	AM Peak	69.1	69.2	0.1
	Midday Peak	67.6	68.8	1.2
	PM Peak	69.8	71.5	1.7
	Pre midnight	63.1	63.2	0.1
	24-Hour L_{eq}	66.8	67.7	0.9
	L_{dn}	70.0	70.5	0.5
6	AM Peak	70.2	72.1	1.9
	Midday Peak	69.1	70.1	1.0
	PM Peak	71.3	71.5	0.2
	Pre midnight	63.8	64.0	0.2
	24-Hour L_{eq}	68.3	69.0	0.7
	L_{dn}	71.5	72.3	0.8

Table 4.6-2 (continued)

Predicted Noise Levels for No Action Alternative and Reuse Plan

Site	Hour	Noise Level (L_{eq} in dBA)		
		No Action Alternative	Reuse Plan	Net Change
7	AM Peak	71.1	74.3	3.2
	Midday Peak	69.2	71.5	2.3
	PM Peak	67.3	70.0	2.7
	Pre midnight	68.7	69.3	0.6
	24-Hour L_{eq}	68.5	70.8	2.3
	L_{dn}	73.5	75.8	2.3
8	AM Peak	59.3	61.7	2.4
	Midday Peak	64.5	66.2	1.7
	PM Peak	61.8	63.4	1.6
	Pre midnight	62.9	65.3	2.4
	24-Hour L_{eq}	62.1	64.0	1.9
	L_{dn}	67.2	69.3	2.1
9	AM Peak	73.9	73.9	0.0
	Midday Peak	74.1	74.4	0.3
	PM Peak	73.3	73.6	0.3
	Pre midnight	71.8	71.9	0.1
	24-Hour L_{eq}	71.7	71.9	0.2
	L_{dn}	75.8	76.0	0.2
10	AM Peak	72.8	73.4	0.6
	Midday Peak	71.8	72.5	0.7
	PM Peak	71.0	71.0	0.0
	Pre midnight	69.8	70.0	0.1
	24-Hour L_{eq}	70.3	70.6	0.5
	L_{dn}	74.3	74.6	0.5

generation. No increase of three dBA or greater would occur at any monitoring site. In addition, stationary source impacts and construction impacts under these alternatives would be similar to those previously described for the Reuse Plan.

However, according to the monitored sound levels discussed in Subchapter 3.6, the traffic on the BQE is contributing high noise levels near the reuse site and, therefore, would have a negative noise impact on the project site if the Residential Alternative were to be implemented.

4.6.4 As-of-Right Alternative

Future mobile source noise impacts associated with the As-of-Right Alternative (Table 4.6-3) would generally be higher than for the Reuse Plan, given the greater amount of daily trip generation. Significant noise increases, ranging from 3.4 to 4.1 dBA, were predicted during the daytime periods at Site 7 due to a traffic merge near the site gate. Even though a 3.1 dBA noise increase was predicted during the am peak period at Site 8, this increase is not considered significant since the absolute level is below 65 dBA. In addition, stationary source noise under this alternative would be similar to the above-described alternatives.

New buildings would be constructed under this alternative. Impacts on community noise levels during construction activities would include noise from construction equipment operating at the site and construction/delivery vehicles traveling to and from the site. Noise impacts would also vary widely, depending on the phase of construction (e.g., demolition, land clearing and excavations, foundation and capping, construction of new building walls, etc.) and the specific task being undertaken. Increased noise levels would be most significant during the early stages of each construction phase, although these periods would be of relatively short duration. Under these circumstances, the noise generated would be similar to noise generated by other building construction projects in the city; furthermore, all phases of construction would comply with the restrictions specified in the NYCDEP *Noise Code* (March 1998).

Noise levels at a given receptor location would depend on the type and number of pieces of construction equipment being operated and the receptor's distance from the construction site. Typical noise levels for construction equipment are shown in Table 4.6-4. In addition, small increases in noise levels would be expected as a result of the operation of delivery trucks and other construction vehicles.

Table 4.6-3

Predicted Noise Levels for No Action and As-of-Right Alternatives

Site	Hour	Noise Level (L_{eq} in dBA)		
		No Action Alternative	As-of-Right Alternative	Net Change
1	AM Peak	62.5	62.5	0.0
	Midday Peak	61.3	61.3	0.0
	PM Peak	63.2	63.2	0.0
	Pre midnight	59.8	59.8	0.0
	24-Hour L_{eq}	60.4	60.4	0.0
	L_{dn}	64.6	64.6	0.0
2	AM Peak	69.5	70.0	0.5
	Midday Peak	70.2	70.6	0.4
	PM Peak	70.6	70.8	0.2
	Pre midnight	64.2	64.4	0.2
	24-Hour L_{eq}	68.9	69.2	0.3
	L_{dn}	72.4	72.6	0.2
3	AM Peak	64.3	64.3	0.0
	Midday Peak	65.2	65.2	0.0
	PM Peak	64.8	64.8	0.0
	Pre midnight	61.3	61.3	0.0
	24-Hour L_{eq}	63.3	63.3	0.0
	L_{dn}	66.9	66.9	0.0
4	AM Peak	70.1	70.1	0.0
	Midday Peak	69.6	69.6	0.0
	PM Peak	67.9	67.9	0.0
	Pre midnight	67.0	67.0	0.0
	24-Hour L_{eq}	67.8	67.8	0.0
	L_{dn}	72.2	72.2	0.0
5	AM Peak	69.1	69.2	0.1
	Midday Peak	67.6	69.1	1.5
	PM Peak	69.8	72.7	2.9
	Pre midnight	63.1	63.3	0.2
	24-Hour L_{eq}	66.8	67.9	1.1
	L_{dn}	70.0	70.7	0.7
6	AM Peak	70.2	72.9	2.7
	Midday Peak	69.1	69.9	0.8
	PM Peak	71.3	71.4	0.1
	Pre midnight	63.8	63.8	0.0
	24-Hour L_{eq}	68.3	69.2	0.9
	L_{dn}	71.5	72.5	1.0

Table 4.6-3 (continued)

Predicted Noise Levels for No Action and As-of-Right Alternatives

Site	Hour	Noise Level (L_{eq} in dBA)		
		No Action Alternative	As-of-Right Alternative	Net Change
7	AM Peak	71.1	75.2	4.1
	Midday Peak	69.2	72.6	3.4
	PM Peak	67.3	71.4	4.1
	Pre midnight	68.7	69.6	0.7
	24-Hour L_{eq}	68.5	71.3	2.8
	L_{dn}	73.5	76.1	2.6
8	AM Peak	59.3	62.4	3.1
	Midday Peak	64.5	65.7	1.2
	PM Peak	61.8	64.4	2.6
	Pre midnight	62.9	64.9	2.0
	24-Hour L_{eq}	62.1	64.1	2.0
	L_{dn}	67.2	69.0	1.8
9	AM Peak	73.9	73.9	0.0
	Midday Peak	74.1	74.3	0.2
	PM Peak	73.3	73.9	0.6
	Pre midnight	71.8	71.9	0.1
	24-Hour L_{eq}	71.7	71.9	0.2
	L_{dn}	75.8	76.0	0.2
10	AM Peak	72.8	73.7	0.9
	Midday Peak	71.8	72.3	0.5
	PM Peak	71.0	71.1	0.1
	Pre midnight	69.8	69.9	0.0
	24-Hour L_{eq}	70.3	70.7	0.4
	L_{dn}	74.3	74.6	0.3

Table 4.6-4

Typical Noise Emission Levels for Construction Equipment

Type of Equipment	Noise Level at 50 ft (15 m) (dBA)
Air compressor	81
Asphalt spreader (paver)	89
Asphalt truck	88
Backhoe	85
Bulldozer	87
Compactor	80
Concrete plant	83
Concrete spreader	89
Concrete mixer	85
Concrete vibrator	76
Crane (derrick)	88
Delivery truck	88
Diamond saw	90
Dredge	88
Dump truck	88
Front end loader	84
Gas-driven vibro-compactor	76
Hoist	76
Jackhammer (paving breaker)	88
Line drill	98
Motor crane	83
Pile driver/extractor	101
Pump	76
Roller	80
Shovel	82
Truck	88
Tug	85
Vibratory pile driver/extractor	89

Source: Patterson, et al., 1974.

4.7 Infrastructure

At its peak during World War II, the Brooklyn Navy Yard employed 70,000 military and civilian personnel. Currently NAVSTA Brooklyn has on-site only security personnel and the mobile-home construction business occupying the foundry building (Bldg 2).

4.7.1 No Action Alternative

Under the No Action Alternative, there would be minimal demand for utilities since the facility would be closed and no permanent maintenance staff would be retained. All unused existing utility systems would be abandoned in place and permanently closed according to the *Base Realignment and Closure Facility Layaway and Caretaker Maintenance Standards* (US Navy, 1994).

4.7.2 Reuse Plan

Electricity

Electrical service to NAVSTA Brooklyn would continue to be provided by Con Ed. One building on the site, Bldg 311, is served directly by Con Ed. Electricity to the remaining buildings is provided by primary and secondary transformers at the site.

Actual future tenants cannot be predicted at this time; therefore, their demands on the electrical system cannot be predicted. It is estimated that under the Reuse Plan 1,630 persons would be employed at the site, and 200 persons per day would visit the site. Given past employment levels at NAVSTA Brooklyn, it is anticipated that Con Ed would be able to meet any new demands occurring under implementation of the Reuse Plan.

Steam

Historically, a steam generating plant in the Navy Yard (now under BNYDC control) supplied all of NAVSTA Brooklyn with heat. Buildings in the western industrial sector of the site still utilize this steam at an average of nine million pounds (lbs) (four kilograms [kg]) per month during the winter season. There are currently unrepaired leaks that impair the efficiency and cost-effectiveness of the steam distribution system. While the remainder of the site is no longer serviced by the on-site steam generating plant, it is possible that such service could once again be provided (City of New York, 1996). The need for upgrading the existing inefficient steam system or usage of an alternative source of heat would be determined by the ultimate developer of the property.

Sewage

Sanitary sewage generated at NAVSTA Brooklyn would continue to be treated at the Newtown Creek WPCP under the Reuse Plan. The Newtown Creek WPCP is subject to a Consent Order between the NYCDEP and the NYSDEC. It sets forth methods for reducing wastewater flow to the plant. Some methods include, for example, water conservation measures, such as installation of low-flow toilet and shower fixtures, water metering, and hydrant locking, as well as diversion to other plants and measures to improve plant operations, and public education. It would be the responsibility of the ultimate developer of the property to determine whether their action would be consistent with the WPCP's Consent Order.

The 1,630 employees projected under the Reuse Plan would generate about 48,900 gpd (185,105 lpd) of daily sanitary waste, and the estimated 200 daily visitors would generate an additional 6,000 gpd (22,712 lpd).The Newtown Creek Water Pollution Control Plant currently operates at an average monthly rate of 240 mgd, dry weather flow. The WPCP's rated capacity, in dry weather flow, is 310 mgd. Since the WPCP entered into the Consent Order with the DEP and DEC, the plant in the past four years has not exceeded the rated capacity of 310 mgd. Future predictions by the DEP (to the year 2050) do not forecast the WPCP to exceed the rated capacity (Pynn, August 13, 1999). The Reuse Plan proposed for NAVSTA Brooklyn will have little or no impact on the WPCP.

Natural Gas

Under the Reuse Plan, it is anticipated that natural gas would continue to be supplied by the Brooklyn Union Gas Company. Only the western industrial area of the site (Bldgs 1, 2, 3, and 5) currently receives natural gas from Brooklyn Union Gas. All other NAVSTA Brooklyn buildings on site have had their gas lines cut and are no longer supplied with natural gas. Should these buildings require natural gas service in the future, provision for that service would be the responsibility of the ultimate developer of the property.

The precise location of the gas lines throughout the site is unknown. As no new construction is proposed, there would be no impact on existing gas lines throughout the site. Given the level of historic usage at the site, it is anticipated that the demand for natural gas at the site would be sufficiently met.

Stormwater

The existing stormwater drainage system at NAVSTA Brooklyn is collected in catch basins and storm drains located throughout the site. The catch basins and storm drains convey the stormwater from NAVSTA Brooklyn to the combined sewer lines of the New York City Sewer System. The Reuse Plan calls for no new construction and, therefore, there would be no development of areas that are currently unpaved which would result in an increase in the amount of impervious surfaces. There

would also be no need for requiring state General Stormwater Discharge Permits to address stormwater runoff from industrial uses, including a plan for minimizing pollutants in runoff.

Water Supply

Potable Water

Potable water would continue to be supplied to the site via the NYC water system. Given the estimated number of employees at the site and the estimated number of visitors per day, the total estimated water usage under the Reuse Plan would be 59,100 gallons (223,717 liters) per day (Table 4.7-1).

Currently the water system appears to be adequate, with some limited repair, to service the existing buildings, although the full extent of leaks and potential water-pressure issues is still unknown (City of New York, 1996). The need for and extent of any repair or upgrading necessary would be determined by the ultimate developer of the property.

Fire Protection

The distribution system supplying domestic water to NAVSTA Brooklyn also supplies the facility's sprinkler systems and fire hydrants. The fire hydrants are located throughout the facility and are spaced at a maximum of 500 ft (152 m) to ensure that the entire site has sufficient fire-fighting capabilities. The current site under the Reuse Plan would continue to be served by the existing fire protection system on site. It would be the responsibility of the ultimate developer of the site to comply with local fire codes should any changes in site layout take place.

Solid Waste

Currently, NAVSTA Brooklyn has contracted privately with Basin Haulage to pick up both residential and commercial waste containers. Under the Reuse Plan, future tenants at the NAVSTA Brooklyn site would be required to contract with private carters for waste collection and disposal.

4.7.3 Residential, Museum, and As-of-Right Alternatives

Electricity

Electrical service to NAVSTA Brooklyn would continue to be provided by Con Ed. As with the Reuse Plan, it is anticipated that adequate power would be available to meet any demand occurring under these alternatives.

Table 4.7-1

Estimated Potable Water Consumption

Category	Reuse Plan		Residential Alternative		Museum Alternative		As-of-Right Alternative	
	No. of People	Estimated total use[1] gallons (liters)	No. of People	Estimated total use[1] gallons (liters)	No. of People	Estimated total use[1] gallons (liters)	No. of People	Estimated total use[1] gallons (liters)
Employees	1,630	48,900 (185,105)	1,050	31,500 (119,240)	1,260	37,800 (143,088)	5,000	150,000 (567,810)
Visitors	200[2]	6,000 (22,712)	N/A	N/A	556[4]	16,680 (63,130)	N/A	N/A
Residents	N/A	N/A	250[3]	7,500 (28,391)	N/A	N/A	N/A	N/A
TOTAL	1,830	54,900 (207,817)	1,300	39,000 (147,631)	1,816	54,480 (206,218)	5,000	150,000 (567,810)

Notes: [1]Per capita water usage is estimated to be 30 gallons (113 liters) per day.
[2]Estimated number of visitors per day.
[3]Based on the approximately 94 dwelling units proposed for the campus portion of the site.
[4]Projected number of visitors per day; number derived from dividing maximum number of projected yearly visitors (200,000) by the approximate number of days per year (360) that the museum would be open to the public.
N/A=Not applicable to this alternative.

Steam

As with the Reuse Plan, the need for upgrading the existing inefficient steam system or usage of an alternative source of heat would be determined by the ultimate developer of the property.

Sewage

As with the Reuse Plan, the amount of sanitary sewage generated under the these alternatives would have no problem in being accommodated by the Newtown Creek WPCP Any upgrading and repair of the current sewer system would be the responsibility of the ultimate developer of the property.

However, any significant new wastewater discharge resulting from individual operation in industrial buildings on-site would need to be in compliance with any federal, state, or local permits and codes. It would be the responsibility of the owner of any such industrial facility to ensure such compliance.

Natural Gas

As no new construction is proposed under the Residential or Museum Alternatives, there would be no impact on existing gas lines. The As-of-Right Alternative includes construction of a total of 2,054 sq ft (190.7 sq m) of new industrial/warehouse structures. The rerouting and relocation of gas lines would be assumed by the ultimate developer of the property. Given the level of historic usage at the site, it is anticipated that the demand for natural gas at the site would be sufficiently met for all alternatives.

Stormwater

As no new construction is proposed under the Residential or Museum Alternatives, the indirect impacts to stormwater systems on the NAVSTA Brooklyn site would be the same as outlined for the Reuse Plan. With respect to stormwater runoff from the As-of-Right Alternative, new construction of the industrial/warehouse structures would create potential impacts (i.e., an increase in the amount of impervious surface area) that would be minimal due to the fact that the development would comply with applicable stormwater discharge rules and regulations. Similarly, the proposed industrial/warehouse structures would be in accordance with all applicable groundwater rules and regulations so as to prevent impairment of groundwater supplies.

Construction activities associated with development of the As-of-Right Alternative would be subject to the National Pollution Discharge and Elimination (NPDES) permit program. Storm water pollution prevention plans would need to be prepared prior to formal approval for permit coverage. The permit would need to include applicable components of the sediment and erosion and control site plan standards, site permits, and stormwater management site plans.

Water Supply

Potable Water

Potable water would continue to be supplied to the site via the NYC water system. Given the estimated number of employees at the site and the estimated number of residents, the total estimated water usage would range from 39,000 gallons (147,631 liters) to 150,000 gallons (567,810 liters) per day (Table 4.7-1).

The water system appears to be adequate, with some limited repair, to service the existing buildings, although the full extent of leaks and potential water-pressure issues is still unknown. The need for and extent of any repair or upgrading necessary would be determined by the ultimate developer of the property.

Fire Protection

Fire Protection to NAVSTA Brooklyn would continue to be provided by the same distribution system as the domestic water supply system. Impacts to water provision for fire protection services under these Alternatives would be the same as outlined for the Reuse Plan

Solid Waste

Solid waste collection under these alternatives would be the same as that outlined under the Reuse Plan.

4.8 Cultural Resources

Section 106 of the National Historic Preservation Act (16 USC 470) provides that federal agencies take into account the effects of their actions on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places. Implementing regulations for Section 106 established by the Advisory Council on Historic Preservation are contained in 36 CFR Part 800: *Protection of Historic Properties*. These regulations provide specific criteria identifying adverse effects of federal undertakings on historic properties. The effects of an undertaking on a cultural resource are predicted by evaluating the significant characteristics of the resource and the design and anticipated consequences of the undertaking. Effects to cultural resources listed in, or eligible for listing in, the National Register of Historic Places are evaluated with regard to the Criteria of Adverse Effect set forth in 36 CFR 800.5(a)(1) (Table 4.8-1).

As described in Subchapter 3.8, cultural resource surveys conducted at NAVSTA Brooklyn identified two NYC landmark buildings that are individually eligible for the National Register and two National Register-eligible historic districts (see following textbox).

National Register-Eligible Properties at NAVSTA Brooklyn

Historic Buildings

- Surgeon's House (Bldg R1)
- Naval Hospital (Bldg R95), with associated archaeological sites

Historic Districts

- US Naval Hospital Historic District

Hospital campus area:	17 contributing buildings 1 contributing structure (perimeter wall) 1 contributing archaeological site (Naval Hospital Cemetery)
BQE frontage area:	2 contributing buildings

- Former Brooklyn Navy Yard Historic District

Northern triangle:	1 contributing building
Western industrial sector:	4 contributing buildings
BQE frontage area:	1 contributing building

Table 4.8-1

Criteria of Adverse Effect

Criteria of Adverse Effect
"An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative." (36 CFR 800.5[a][1])
Examples of Adverse Effect
"Adverse effects on historic properties include, but are not limited to: 1. Physical destruction of or damage to all or part of the property; 2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines; 3. Removal of the property from its historic location; 4. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; 5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features; 6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; 7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance." (36 CFR 800.5[a][2])

4.8.1 No Action Alternative

Under the No Action Alternative, the Navy would not dispose of NAVSTA Brooklyn. The Navy would retain ownership of the property, and the facilities would remain closed in accordance with the standards and procedures for mothballing facilities published in *Base Realignment and Closure Facility Layaway and Caretaker Maintenance Standards* (US Navy, 1994). These guidelines and procedures meet the requirements for mothballing historic structures outlined by the National Park Service in *Preservation Brief 31: Mothballing Historic Buildings* (US Department of Interior [USDOI], 1993). Since all on-site structures would be closed according to Navy guidelines, no adverse effects to the individually eligible historic buildings or the buildings that contribute to the historic districts would result.

Beyond closure of the facilities, no new construction or property disturbance would occur; therefore, there would be no adverse effects to historic properties under the No Action Alternative.

Under the No Action Alternative, the Navy would continue to implement its cemetery plan at the cemetery site. This plan entails landscaping immediately outside the cemetery area, and providing a grassy cover to the cemetery (Figure 2-3).

4.8.2 Reuse Plan

The proposed disposal of NAVSTA Brooklyn by the Navy results in a finding of adverse effect on the site's historic properties. To address this effect, the Navy will execute a Programmatic Agreement (PA) with the NY SHPO that identifies required restrictive deed covenants as mitigation. In addition to the Navy's disposal action, implementation of the Reuse Plan by the city or private developers could result in effects on historic properties at NAVSTA Brooklyn. These potential effects are discussed below.

Historic Buildings

The Reuse Plan would require alterations to the hospital (Bldg R95) and Surgeon's House (Bldg R1) to accommodate proposed uses such as a day care center, health center, job-training center, school, or institutional offices. These alterations would be performed by the ultimate developer of the property. If future alterations to these structures are performed in accordance with the *Secretary of Interior's Standards for Rehabilitation*, no adverse effects would be anticipated (USDOI, 1992; 36 CFR 800.9[c]2). In addition, because the two structures are New York City landmarks, the proposed work would undergo review and permitting by the Landmarks Preservation Commission (Local Laws of the City of New York, Section 534).

US Naval Hospital Historic District

Under the Reuse Plan, most contributing buildings for the US Naval Hospital Historic District (Hospital Historic District) would be reused for institutional uses ranging from day care facilities to institutional offices. Only Bldgs RD and R426 would be used for commercial purposes. If the adaptive reuse of all contributing buildings is done in accordance with the *Secretary of Interior's Standards for Rehabilitation*, no adverse effect would be anticipated (USDOI, 1992; 36 CFR 800.9[c]2).

Demolition of contributing and non-contributing buildings would also occur within the Hospital Historic District. Removal of non-contributing buildings (e.g., gazebo, Hewes Street gatehouse [Bldg R476], and gas station [Bldg R475]) would have no adverse effect on the Hospital Historic District. Demolition of contributing buildings also could occur. The only contributing building currently slated for demolition under the Reuse Plan is the greenhouse (Bldg R448), which no longer retains historic integrity. The superstructure is gone, and removal of the foundation would not have an adverse impact on the district. However, if additional demolition of contributing buildings occurs under the Reuse Plan, adverse effects to the district would result.

The Reuse Plan involves circulation changes within the Hospital Historic District. Entrances are proposed at the original hospital gate on Flushing Avenue between Hall Street and Grand Avenue, and a gate at Hewes Street and Kent Avenue near Bldg R476. Reviving these entrances would have no adverse impact on the Hospital Historic District since traffic historically entered the campus at these access points.

Creation of parking spaces in existing paved areas is proposed within the historic district. However, parking spaces may also be provided within the unpaved areas of the Hospital Historic District. If new parking avoids the Memorial Area and cemetery, no adverse effects would be anticipated.

If a fence or other barrier is ultimately erected to separate the institutional uses in the hospital campus from the commercial uses within the BQE frontage area, it could potentially affect the character of the district. However, if such a barrier were erected in accordance with the *Secretary of Interior's Standards for the Treatment of Historic Properties*, it would have no adverse effect on the district (USDOI, 1992; 36 CFR 800.9[c]2).

Under the Reuse Plan, the Memorial Area and cemetery site would not be disturbed; therefore, no adverse effects would occur to these contributing resources. The Navy would continue to implement its cemetery plan at the cemetery site. This plan entails landscaping immediately outside the cemetery area, and providing a grassy cover to the cemetery.

Former Brooklyn Navy Yard Historic District

One contributing building (Bldg 311) and three non-contributing buildings (Bldgs 306, 316, and 353) of the Former Brooklyn Navy Yard Historic District (Navy Yard Historic District) would be reused for light industrial or commercial uses, and existing paved space would accommodate parking. Other contributing buildings could be used for a variety of purposes, but would likely be used as follows:

- Bldg 1 for high-tech manufacturing, research or mix of light industry and offices;
- Bldg 2 for vehicle repair; and
- Bldg 5 for office space.

If the adaptive reuse of all contributing buildings is done in accordance with the *Secretary of Interior's Standards for Rehabilitation*, no adverse effect to the Navy Yard Historic District would be anticipated (USDOI, 1992; 36 CFR 800.9[c]2).

Demolition of contributing structures (e.g., Bldg 7, a former substation) to the Navy Yard Historic District also could occur under the Reuse Plan. If contributing buildings are demolished, an adverse effect on the historic district would result.

Circulation within the Navy Yard Historic District would use existing access points through the BNYDC-controlled Navy Yard or from former gateways in the BQE frontage area. These patterns would have no adverse effect on the Navy Yard Historic District since traffic historically entered from these points.

Parking is also proposed within the Navy Yard Historic District's paved areas. As these areas currently accommodate parking, there would be no adverse effect.

4.8.3 Residential Alternative

The effects on historic properties from disposal and reuse of NAVSTA Brooklyn under the Residential Alternative would be similar to those described for the Reuse Plan. The only difference would be that the buildings within the Hospital Historic District that were proposed for institutional use would be reused for residential purposes. However, if alterations associated with the reuse are performed in accordance with the *Secretary of Interior's Standards for Rehabilitation*, no adverse effects on these structures would be anticipated (USDOI, 1992; 36 CFR 800.9[c]2).

The impacts from demolition of contributing structures, proposed parking, and fencing, and effects on the Memorial Area and cemetery, would be the same as discussed under the Reuse Plan.

4.8.4 Museum Alternative

The effects on historic properties from disposal and reuse of NAVSTA Brooklyn under the Museum Alternative would be similar to those described for the Reuse Plan. The only differences would be that the buildings within the US Naval Hospital Historic District that were proposed for institutional and commercial uses would be reused for museum purposes, and Bldg 311 within the Navy Yard historic district proposed for commercial use under the Reuse Plan would also be used for museum purposes. However, if alterations associated with these uses are performed in accordance with the *Secretary of Interior's Standards for Rehabilitation*, no adverse effects on these structures would be anticipated (USDOI, 1992; 36 CFR 800.9[c]2).

The impacts from demolition of contributing structures, proposed parking, and fencing, and effects on the Memorial Area and cemetery, would be the same as discussed under the Reuse Plan.

4.8.5 As-of-Right Alternative

Under the As-of-Right Alternative, effects on the hospital (Bldg R95) and Surgeon's House (Bldg R1) would be similar to those described for the Reuse Plan, except that the properties would be reused for industrial purposes rather than institutional. If alterations associated with these uses are performed in accordance with the *Secretary of Interior's Standards for Rehabilitation*, no adverse effects on these structures would be anticipated (USDOI, 1992; 36 CFR 800.9[c]2).

With the exception of these two structures, the remaining contributing buildings and structures within the Hospital Historic District would be demolished and replaced with new construction. This action would result in an adverse effect on the Hospital Historic District because components that contribute to the significance of the district would be removed and its historic location, setting, feeling, and association would be compromised (36 CFR 800.9[b]1-3). New construction would also likely affect the contributing Memorial Area, which consists of a flagpole monument set within a small lawn. Elimination of this feature would alter the historic character of the Hospital Historic District and would result in an adverse effect (36 CFR 800.9[b]3). No disturbance of the cemetery would occur under the As-of-Right Alternative.

The majority of contributing buildings within the Navy Yard Historic District would be replaced with new construction. Only the lab (Bldg 1) and foundry (Bldg 2) in the western industrial sector would remain. The demolition of the contributing buildings would result in an adverse effect on this historic district, and therefore a significant impact on cultural resources would occur.

4.9 Natural Resources

4.9.1 No Action Alternative

Under the No Action Alternative, existing natural resources would remain unchanged. The majority of the site would remain filled and paved and would continue to be of limited value with regard to natural resources.

4.9.2 Reuse Plan

Biological Resources

The NAVSTA Brooklyn site has been filled and paved to such an extent that few natural features remain. Unpaved areas are currently characterized by maintained grass lawns, ballfields, and ornamental trees adjacent to roadways. No new construction is planned under the Reuse Plan; thus, no adverse impact would be anticipated. The site currently provides, and would continue to provide, limited habitat for wildlife. There are no threatened and endangered species or their habitats at the site.

Wetlands and Floodplains

There are no wetlands at the NAVSTA Brooklyn site and, as no new construction would take place, there would be no adverse impact to the floodplain.

Water Resources

There would be no impacts on groundwater under the Reuse Plan. NAVSTA Brooklyn would continue to draw water from New York City. No impacts to surface water would occur because there are no streams, creeks, or lakes located on the NAVSTA Brooklyn site.

Topography, Geology, and Soils

No construction activities would take place under the Reuse Plan. NAVSTA Brooklyn is located on filled land where the original soils have been greatly disturbed; thus, there would be no impact to topography, geology, and soils.

4.9.3 Residential, Museum, and As-of-Right Alternatives

Impacts to natural resources under the Residential, Museum, and As-of-Right Alternatives would be the same as discussed for the Reuse Plan.

However, because the As-of-Right Alternative proposes a maximum buildout of the site, potential effects to the following natural resources differ from those discussed for the Reuse Plan:

- **Biological Resources**: Undeveloped areas would be utilized for building footprints, parking areas, and ornamental lawns. The only open space that would remain is the 1.7 acres (0.69 hectares) of land that is occupied by the cemetery. However, this loss of open space would not present a significant impact to wildlife because the undeveloped areas are currently of low wildlife value.

- **Wetlands and Floodplains**: A small portion of the site lies within the 500-year floodplain. If construction activities were to take place within this area, all structures would have to conform to FEMA floodplain standards. There are no wetlands at NAVSTA Brooklyn.

- **Topography, Geology, and Soils**: A soil and erosion control plan would be developed and adhered to for significant construction projects involving earthmoving activities. NAVSTA Brooklyn is located on filled land where the original soils have been greatly disturbed; thus, there would be no impact to topography, geology, and soils.

4.10 Petroleum and Hazardous Substances

4.10.1 No Action Alternative

The Navy is obligated to comply with DoD Defense Environmental Security Council policies for radon (May 6, 1994), lead-based paint (LBP) (May 10, 1994), and asbestos-containing material (ACM) (May 10, 1994). These policies provide guidance for addressing radon, LBP, and ACM at installations before their demolition, transfer, or disposal, as follows:

- **Radon**: DoD policy is to ensure that any available and relevant radon assessment data pertaining to property being transferred is included in property transfer documents. No radon data are available for the NAVSTA Brooklyn property.

- **Lead-based paint**: DoD policy on LBP depends upon the date of the property transfer and the date of construction of the residential housing being transferred. Housing. constructed after 1960 and before 1978 must be inspected for LBP hazards, although no abatement is required. Target housing constructed before 1960 must be inspected for LBP hazards, and such hazards must be abated. However, DoD policy does not require LBP inspection and abatement when a building is scheduled for demolition by the transferees and the transfer document prohibits occupation of the building prior to demolition or when a building is not targeted for reuse.

  Abatement of LBP exposure was completed in residential structures and dwellings in 1996. Reuse of nonresidential structures for community use would require sampling, abatement, and worker and building occupant protection in accordance with all city, state, and federal regulations. Notification of the presence of LBP would be incorporated into the deed.

- **Asbestos-containing material**: The DoD policy with regard to ACM is to manage it in a manner protective of human health and the environment, and to comply with all applicable federal, state, and local laws and regulations governing ACM hazards. Unless it is determined by a certified industrial hygienist that ACM at the property does pose a threat to human health at the time of transfer, all property containing ACM would be conveyed, leased, or otherwise disposed of "as is."

  Assuming the previous conditions are met, the transferee assumes responsibility for the future management of ACM in accordance with applicable laws. The Navy has completed the removal of friable, accessible, and damaged (FAD) ACM prior to property transfer, in accordance with their policy (US Navy, 1994). However, since the Navy is only removing FAD ACM, some ACM would remain. Therefore, subsequent renovations requiring the disturbance or removal of ACM would have to

be performed in accordance with all applicable city, state, and federal regulations. Notification of the presence of ACM would be incorporated into the deed.

Under the No Action Alternative, the Navy's use of hazardous materials would continue to be limited to the need to satisfy caretaker functions, as it has been since NAVSTA Brooklyn was operationally closed in 1993. The status of the LBP survey and asbestos survey is outlined in Chapter 3.10.1. Environmental abatement and cleanup activities at NAVSTA Brooklyn have been completed.

4.10.2 Reuse Plan

Site Contamination

The disposal of excess DoD property related to base closure and realignment is a process that includes: (1) preparation of an Environmental Baseline Survey (EBS) and (2) issuance of a Finding of Suitability for Transfer (FOST). The purpose of the FOST is to report the environmental suitability of a parcel for transfer to nonfederal agencies or to the public by disclosing that one of the following is true:

- No hazardous substances were known to have been released or disposed of on the parcel; or

- The requirements in CERCLA 120(h)(3) have been met for the parcel being transferred. CERCLA 120(h)(3) specifies that, where the above does not apply, deeds to transfer must disclose/contain:

    - Information on the type, quantity, and time of release of hazardous substances, and a description of the remedial action (RA) taken, if any;

    - A covenant warranting that all RA necessary to protect human health and the environment with respect to any such substance has been taken before the date of transfer and any additional RA found to be necessary after the date of such transfer shall be conducted by the federal government; and

    - A clause granting the federal government access to the property for RA.

Completion of RA does not necessarily have to take place prior to property transfer. If the construction or installation of an approved remedial design has been completed, and the remedy has been demonstrated to the USEPA to be operating properly and successfully, the property could be transferred prior to complete remediation.

The Navy is coordinating with the City of New York to address the environmental issues related to transferring parcels scheduled for reuse. The DoN Policy Memorandum 95-02, *Consideration of Future Land Use in Determining Cleanup Standards for Base Realignment and Closure Property* (August 17, 1995), applies to the cleanup of NAVSTA Brooklyn. In addressing the cleanup levels, consideration would be given to BRAC future land use as identified by the City of New York.

Site investigations and cleanup actions at NAVSTA Brooklyn have been completed, which resulted in NYSDEC delisting areas of NAVSTA Brooklyn as inactive hazardous waste sites in December 1997.

Building Use and Reuse by the Community

Any reuse, modification, renovation, and/or demolition of buildings will have to address the issues of LBP and asbestos:

- Lead-based Paint – Due to the age of most of the buildings at NAVSTA Brooklyn, the presence of some LBP should be assumed. Reuse and/or modifications to any of the buildings would take into consideration the likelihood of a LBP hazard relative to reuse.

- Asbestos – Asbestos must be abated in accordance with 40 CFR Part 61 Subpart M (National Emission Standard for Asbestos) and Part 61.145 (Standard for Demolition and Renovation) and appropriate NYS and NYC regulations.

Petroleum and Hazardous Substance Generation

The Reuse Plan consists of industrial, commercial, open space, recreational, and institutional components. The industrial and/or commercial components may generate petroleum and hazardous substances during routine operations.

New industries or businesses locating to the site may use some hazardous materials and/or generate some petroleum and/or hazardous substances; the types and amounts of these materials cannot be specified at this time, as the actual future tenants are not known. These tenants would need to coordinate with appropriate federal, state (e.g., NYSDEC), and local (e.g., the NYC Fire Department) regulatory agencies regarding the use and generation of hazardous materials or wastes. Any reuse, modification, renovation, and/or demolition of buildings would have to address the issues of LBP and asbestos.

4.10.3 Residential, Museum, and As-of-Right Alternatives

The Residential, Museum, and As-of-Right Alternatives include many of the same uses as the Reuse Plan, with the particular exception of residential development in the hospital campus under the Residential Alternative. Therefore, impacts are similar to those discussed under the Reuse Plan.

As in the Reuse Plan, new industries and businesses locating to the site may use some hazardous materials and/or generate some petroleum and/or hazardous substances; the types and amounts of these materials cannot be specified at this time, as the actual future tenants are not known. These tenants would need to coordinate with appropriate federal, state, and local regulatory agencies regarding the use and generation of hazardous materials or wastes. Any reuse, modification, renovation, and/or demolition of buildings would have to address the issues of LBP and asbestos.

4.11 Cumulative Impacts of the Preferred Alternative

This chapter addresses the cumulative impacts of the preferred alternative, the Reuse Plan. Cumulative impacts have been defined by the CEQ in 40 CFR 1508.7 as:

> "*impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.*"

The CEQ regulations also state that the cumulative impacts addressed should not be limited to those from actual proposals, but must include impacts from actions being contemplated or that are reasonably foreseeable.

Cumulative impacts to the study area, as a result of the redevelopment of NAVSTA Brooklyn under the preferred action (the community's Reuse Plan), would include the development of an estimated 1,630 industrial, commercial, and community/institutional jobs accommodated in the existing structures on site. These activities are in accord with historic uses of the site. Implementation of the Reuse Plan is not anticipated to create induced development impacts in the surrounding community.

Interviews with the NYC DCP, Brooklyn Office, in 1997 and 1998 indicated that few projects were planned in the study area. The most significant project identified by DCP is in the Williamsburg I Urban Renewal Area (site 5A at Kent Avenue near Clymer Street), where a private developer plans to build approximately 150 units of housing, in part using the shell of an existing building. Another residential project under construction between Flushing Avenue and Wallabout Street involves 75 units. These were specifically included in the future No Action Alternative. Other development projects in the area are relatively small and are included within the background growth factors used in the traffic analysis or demographic projections for the area.

Another project that has very recently been proposed for the BNYDC-controlled Navy Yard is a 400,000-sq ft (37,160-sq m) movie studio on a 15-acre (6.1-hectare) parcel to the northwest of NAVSTA Brooklyn. The financing for this project is not yet in place and the BNYDC has not signed any lease agreement; thus, the project remains speculative. This studio project and its potential activity have not been factored into the traffic and other analyses included in this document.

The Reuse Plan's proposed reuse of the NAVSTA Brooklyn site is not expected to have a significant cumulative effect on the surrounding section of Brooklyn.

5 MITIGATION MEASURES

This chapter identifies mitigation measures that would minimize or eliminate impacts (Subchapters 4.1-4.11) of the action alternatives on the existing natural and man-made resources of the site and surrounding area (Subchapters 3.1-3.10). With the exception of the Programmatic Agreement regarding cultural resources, these measures, or other similar and/or additional actions, would be implemented by the City of New York or an applicant proposing redevelopment at NAVSTA Brooklyn.

5.1 Reuse Plan

Land Use, Socioeconomics, and Community Facilities and Services

No significant environmental impacts have been identified and therefore no mitigation is required.

Transportation

Implementation of the Reuse Plan would cause significant traffic impacts at the following signalized study area intersections:

- Williamsburg Street West and Flushing Avenue (Location 4);
- Classon Avenue and Flushing Avenue (Location 5); and
- Flushing Avenue and Clinton Avenue (Location 6).

For these locations, modifications to the signal timing were investigated as potential mitigation measures. Geometric improvements were not a viable option due to extensive development in the area. Table 5-1 provides a comparison of the traffic analyses for unmitigated and mitigated conditions. Traffic conditions would improve to acceptable levels (LOS C) at Location 4. Conditions at Location 5 would improve to acceptable levels in the pm peak; however, in the am peak the improvement would not quite achieve LOS C. It is important to note that these two locations are in close proximity, and coordination of the two signals would be necessary to see the predicted improvements.

Table 5-1

Summary of LOS Analysis, Reuse Plan

Intersection	Unmitigated Condition		Mitigated Condition	
	AM Peak	PM Peak	AM Peak	PM Peak
Williamsburg Street West and Flushing Avenue (Location 4)				
Westbound LTR	C	B	C	B
Northbound L	E	F	D	E
Northbound T	E	B	C	B
Southbound TR	B	B	C	D
Overall	D	F	C	C
Classon Avenue and Flushing Avenue (Location 5)				
Eastbound LTR	C	C	C	C
Northbound TR	C	B	E	C
Southbound L	F	F	D	D
Southbound T	B	B	B	B
Overall	F	F	D	C
Flushing Avenue and Clinton Avenue (Location 6)				
Eastbound LTR	–	A	–	A
Westbound LTR	–	E	–	B
Northbound LTR	–	B	–	B
Southbound LTR	–	B	–	B
Overall	–	D	–	B
Notes: L=Left; T=Through; R=Right				

- Williamsburg Street West and Flushing Avenue (Location 4) – The northbound approach is currently striped for a through/left movement and a through movement. In the mitigated condition, the approach would be restriped for a dedicated left-turn movement and a through movement. Along with this restriping, an additional phase would be added to allow for a protected left turn in the northbound approach. The green time for the westbound approach would be unchanged; therefore, this approach would be unaffected. These measures would improve overall operation of the intersection from LOS F to LOS C in both the am and pm peaks.

- Classon Avenue and Flushing Avenue (Location 5) – The southbound approach is currently striped for a through/left movement and a through movement. In the mitigated condition, the approach would be restriped for a dedicated left-turn movement and a through movement. Along with this restriping, an additional phase would be added to allow for a protected left turn in the southbound approach. The eastbound approach would be unchanged and, therefore, unaffected. These measures would improve overall operation of the intersection from LOS F to LOS D in the am peak, and LOS C in the pm peak. It is important to note that even though LOS D is considered "marginally unacceptable" in the NYC CEQR Technical Manual (1993), the delay time associated with LOS determination is within a few seconds of being considered a LOS C in the am peak.

- Flushing Avenue and Clinton Avenue (Location 6) – The westbound approach is surcharged with a significant amount of vehicles turning left onto Clinton Avenue in the pm peak condition. A simple adjustment to allow additional green time for this movement would improve the approach level of service from LOS E to LOS B. This would improve the overall operation of the intersection from LOS D to LOS B.

Air Quality

No significant impacts from mobile sources have been identified and therefore no mitigation is required. Short-term construction and demolition-related effects on air quality would occur, but impacts could be alleviated through implementation of common construction management practices (e.g., dust suppression, phasing of construction, etc.).

Noise

Demolition and construction activities would temporarily increase noise levels near construction areas. To mitigate these temporary noise effects, these activities would only take place during regular working hours.

Under the Reuse Plan, a traffic noise increase of 3.2 dBA, considered significant under the NYC CEQR standards, would be anticipated at Site 7 during the am peak period. Under the As-of-Right

Alternative, significant traffic noise increases (ranging from 3.4 to 4.1 dBA) would be anticipated at Site 7 during the daytime periods. While the proposed action is not a highway project, the FHWA noise regulations (23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise) offer a range of noise abatement measures that can be evaluated in the context of the proposed action. The regulations require that feasible and reasonable noise abatement measures be considered to mitigate a noise impact caused by highway traffic. Several types of noise abatement measures are typically evaluated, including:

- Installation of a noise barrier – This measure is not feasible at this site for several reasons. The principal source of noise at these receptors is local vehicular traffic on local streets; however, it would be impractical to construct barriers along the edge of local streets, as they would create safety problems, be interrupted for driveway access (which would reduce their effectiveness).

- Traffic management – Traffic management measures, such as prohibition of local traffic, are sometimes feasible for noise abatement. However, this is not possible on those local streets that would serve as major traffic routes to the site.

- Alteration of horizontal and vertical roadway alignment – Alignment alteration is not feasible since the roadway network to the site is in place. No new roadways are proposed.

- Designation of a buffer zone – Where unimproved property adjoins the corridor, and adverse noise impacts are forecasted to extend beyond the roadway right-of-way, consideration can be given to establishing a buffer space between the road and impacted receptors. Since impacted sensitive receptors are adjacent to Flushing Avenue and Clinton Avenue, no buffer area can be created.

- Noise insulation of public-use or not-for-profit institutional structures – The sound insulation of public-use or not-for-profit institutional structures can be considered as an alternative to barrier construction. However, there are currently no impacted public buildings near Site 7.

Thus, none of the above mitigation measures would be feasible or reasonable and noise impacts would remain significant at the playground near the site gate during the daytime periods.

Infrastructure

No significant impacts have been identified and therefore no mitigation is required. However, the on-site wastewater and storm sewer systems appear to require upgrading. This would be the responsibility of the ultimate developer of the site.

Cultural Resources

The entire site represents a National Register-eligible historic resource, comprising two districts (the US Naval Hospital District and the Former Brooklyn Navy Yard District). Archaeologically sensitive resources are the Naval Hospital Cemetery and the Naval Hospital archaeological site. The Naval Hospital is also a NYC Landmark building. The Naval Hospital Cemetery will remain a cemetery and will not be redeveloped.

Future implementation of the Reuse Plan by the city or private developers also would result in effects on historic properties on-site. Avoidance of adverse effects to individually eligible or contributing historic structures would be accomplished through the utilization of proper preservation of all historic structures and adherence to the *Secretary of Interior's Standards for the Treatment of Historic Properties* (US DOI, 1992) in the adaptive reuse of these structures.

The proposed disposal of NAVSTA Brooklyn results in a finding of adverse effect on the site's historic properties. To address this effect, the Navy will execute a Programmatic Agreement with the NY SHPO that identifies required mitigation and provides protective covenants.

Natural Resources

No natural resources would be impacted by implementation of the Reuse Plan; thus, no mitigation is required.

Hazardous Substances

Section 120(h) of CERCLA addresses property transferred by federal agencies and specifies the contents of deeds to transfer such property. The deeds must contain the following two parts:

> (1) a covenant warranting that remedial action (RA) has been taken and that "any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States;" and
>
> (2) "a clause granting the federal government access to the property for remedial action."

The DoD has adopted specific policies that apply to radon, LBP, and asbestos at BRAC properties, as described in detail in Subchapter 4.10. These policies define the obligation of the Navy with respect to addressing radon, LBP, and asbestos at installations prior to their demolition, transfer, or disposal. Compliance with these policies would ensure that there would be no impacts related to these substances upon transfer of the NAVSTA Brooklyn property.

5.2 Residential and Museum Alternatives

Compared to the Reuse Plan, implementation of the Residential and Museum Alternatives would result in similar impacts in the areas of traffic, air quality, noise, cultural resources, and hazardous substances. Executing the same proposed traffic mitigation measures as proposed under the Reuse Plan would reduce or eliminate potential impacts as described.

5.3 As-of-Right Alternative

Compared to the Reuse Plan, implementation of the As-of-Right Alternative would result in similar impacts in the areas of traffic, air quality, noise, and hazardous substances. Executing the same proposed traffic mitigation measures as proposed under the Reuse Plan would reduce or eliminate potential impacts as described.

Under the As-of-Right Alternative, adverse results to historic properties would occur from the disposal of the property by the Navy and from the demolition of historic buildings, structures, and sites. The Navy will execute a Programmatic Agreement with the NY SHPO that identifies required mitigation.

6 RELATIONSHIP OF THE PROPOSED ACTION TO FEDERAL, STATE, AND LOCAL PLANS, POLICIES, AND CONTROLS

Disposal and reuse of the NAVSTA Brooklyn site would comply with existing federal regulations and with state, regional, and local policies and programs.

The federal acts and executive orders with which the proposed action must demonstrate compliance include:

- NEPA;
- RCRA, CERCLA, SARA, and CERFA;
- Clean Water Act;
- Clean Air Act;
- Endangered Species Act;
- National Historic Preservation Act;
- Coastal Zone Management Act;
- Toxic Substances Control Act;
- Executive Order 11990, Protection of Wetlands;
- Executive Order 11988, Floodplain Management;
- Executive Order 12898, Environmental Justice; and
- Executive Order 13045, Protection of Children from Environmental Health and Safety Risks.

As discussed in Chapter 1, this EIS has been prepared in accordance with the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1500-1508) and Navy NEPA procedures (OPNAVINST 5090.1B). Executive Order 11991 of May 24, 1977 directed the CEQ to issue regulations for procedural provisions of NEPA; these are binding for all federal agencies.

Implementation of the Reuse Plan or its alternatives would need to demonstrate compliance with applicable state and local plans, policies, and controls.

7 UNAVOIDABLE ADVERSE EFFECTS

The disposal and reuse of NAVSTA Brooklyn pursuant to the Reuse Plan would result in the following unavoidable adverse effects:

- **Transportation:** The additional trips generated by the proposed action would create traffic delays at two intersections. However, for these locations, modifications to the signal timing would improve traffic conditions to acceptable levels (LOS C) at one and within a few seconds of LOS C at the other.

- **Noise:** There would be an increase of three dBA or greater in traffic noise levels at one monitoring site (Site 7) during the am peak period. This is a playground located on Flushing Avenue near the BQE that would experience a barely perceptible noise increase due to traffic merge near the site.

- **Cultural Resources:** The proposed disposal of NAVSTA Brooklyn by the Navy results in a finding of adverse effect on the site's historic properties. To address this effect, the Navy will execute a Programmatic Agreement with the NY SHPO that identifies required mitigation. Implementation of the Reuse Plan also could result in effects on the historic properties at NAVSTA Brooklyn. These potential effects can be mitigated if the adaptive reuse is conducted in accordance with the *Secretary of Interior's Standard's for Rehabilitation* (USDOI, 1992; 36 CFR 800.9[c]2). Mitigative restrictive deed covenants for these potential adverse effects are specified in the related Programmatic Agreement.

8 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Positive consequences of implementing the Reuse Plan would include the provision of new employment opportunities and concomitant earnings; new state and local tax revenues; and new community facilities and open space.

During the proposed renovation and reuse phases of the disposal and reuse of NAVSTA Brooklyn, there would be some short-term adverse impacts on the environment. These would include some short-term vehicular traffic disruptions, increased noise levels associated with construction activities, and diminution of air quality due to fugitive dust and vehicular emissions.

Longer-term negative impacts would include increases in traffic volumes and consequent air quality and noise impacts. The Reuse Plan could also result in increased generation of sewage, water usage, and energy consumption. None of the impacts, however, would be expected to adversely affect the long-term productivity of the site (e.g., in terms of economics, demographics, natural resources, etc).

9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

While the disposal and reuse of the NAVSTA Brooklyn property would bring benefits to the Clinton Hill and Williamsburg districts of the borough of Brooklyn, nonrenewable resources would be consumed during the design, construction, and implementation of the proposed action. Since the reuse of these resources is impossible, they must be considered irreversibly and irretrievably committed to the development of the proposed project. The finite resources that would be irretrievably committed by implementation of the proposed reuse are the expendable materials such as steel, concrete, and glass; fuel and other forms of energy utilized during renovation and rehabilitation activities; and the supplies and energy resources (in the form of water for steam and gas and electricity expended in heating and cooling facilities) necessary to operate and maintain the reused structures after renovation or rehabilitation.

Public and/or private funds committed to the design, construction, and operation of the proposed redevelopment would not be available for the use of other projects. The disposal of construction debris would also result in an irreversible and irretrievable commitment of landfill or other solid-waste disposal capacity.

The public services that would be provided in connection with new development at NAVSTA (e.g., police and fire protection services) also constitute resource commitments that might otherwise be used for other programs or projects, although the proposed reuse components would also generate tax revenues to provide additional public funds for such activities. The human labor expended for development and operation of the Reuse Plan would also be considered irrevocable.

10 PUBLIC REVIEW PROCESS AND RESPONSE TO COMMENTS

Public involvement in the review of EISs is stipulated in 40 CFR Part 1503 of the CEQ's regulations implementing NEPA, and in OPNAVINST 5090.1B. These regulations and guidance provide for active solicitation of public comment via scoping meetings, public comment periods, and public hearings. This chapter will be completed as part of the FEIS and will respond to the specific questions and comments raised by individual commentors during the public comment period on the *Draft Environmental Impact Statement for Disposal and Reuse of NAVSTA Brooklyn.*

10.1 Overview of Public Review Process

EISs are issue-oriented, and input from the public – including citizens, elected officials, special interest groups, and local, state, and federal agencies – is very important. Public involvement should:

- Promote understanding on the part of the public about the way environmental problems are studied and solved;
- Keep the public informed about the project and the EIS; and
- Actively seek opinions and perceptions from all concerned citizens.

10.1.1 Public Review Process

Notice of Intent

The formal notice of intent to prepare an EIS for disposal and reuse of NAVSTA Brooklyn was published in the *Federal Register* on January 31, 1997.

Public Scoping Meetings

The public scoping meetings were held on February 13, 1997 at the NYC Department of City Planning, 22 Reade Street, NY, NY, at 10:00 am and at Brooklyn Borough Hall, 209 Joralemon Street, Brooklyn, at 7:00 pm.

The two public scoping meetings were attended by approximately 30 persons, and nine comments were offered. An additional five comments were received via mail. General areas of concern expressed by commentors included (but not listed in order of importance):

- Suitability of open space for park use, particularly with issues of site infrastructure, paving, asbestos, and tanks;
- Use of income-generating sectors of site to support cultural institutions;
- Section 106 consultation – Advisory Council;
- Concern about incidence of asthma and prospect of incinerator;
- Minority access to jobs;
- Desire to have a school to teach sailing;
- Site should be a museum and monument to heroes;
- Legal issues on interim uses and guidelines, indemnification on liability issues;
- Will the residential alternative assume residential rezoning of the site;
- Community should be provided with cleanup reports;
- Air quality issues – analysis of existing cogeneration facilities and other stationary sources;
- Possible discharge of untreated wastewater to the East River;
- Location in the Brooklyn/Queens Aquifer – a sole-source aquifer and requiring assessment according to SDWA;
- Cultural resources "topic intensive" documentary study for the project area, providing evidence of complete removal of human remains – should be consultation with SHPO and the Advisory Council on Historic Preservation, and should be completed before remains are removed;
- Maintaining the cohesiveness of the hospital annex site;
- Restore and maintain landmark structures; provide full access for active and passive recreation;
- Provide access to the water's edge;

- Navy should continue as title-holder until cleanup complete and cultural resources fully identified;
- The quarter-mile study area radius is not representative and should be extended to a half-mile;
- Concerns with as-of-right industrial uses of toxic materials in the proposed industrial parcels and any fugitive air emissions future uses may generate;
- Traffic – BQE should not be considered primary travel route except for commercial truck traffic;
- Should include prospective redevelopment of nine-acre site along Kent Avenue (likely to be retail);
- Need to coordinate with plans to rehabilitate Manhattan Bridge to the Flushing Avenue section of the BQE; and
- Include a pedestrian analysis, specifically with respect to ADA along site perimeters and corridors to likely site-access points.

10.1.2 Public Hearings and Comment Opportunities for the DEIS

Upon publication of a formal Notice of Availability published by USEPA *Federal Register*, the public review period for the DEIS will commence. The DEIS will be distributed to officials of federal, state, and local governments, citizen groups and associations, and other interested parties.

During this period, public comment on the DEIS is sought on a variety of issues, including the range of alternatives considered and their associated impacts, the accuracy and completeness of data included, and the conclusions reached in the document. The Navy is committed to holding a public hearing during the public comment period, the schedule for which will be widely published. The remainder of this portion of the DEIS will be finalized after completion of the public review period.

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Helen Chernoff, Senior Scientist: 12 years of experience performing ecological and human health risk assessments, environmental impact analyses, and various types of hazardous waste investigations (CERCLA/RCRA). State University of New York at Binghamton, 1982, BS, Biology; Florida State University, 1985, MS, Biology.

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A. Michael Pappalardo, Senior Archaeologist: 11 years of experience in cultural resource management working both in the context of Section 106 compliance and state- and local-level legislation. New York University, 1988, BA, Anthropology; Binghamton University, 1992, MA, Anthropology.

R. Andrew Parker, Principal Planner/Economist: 28 years of experience in urban planning and economic analysis. University of London, 1970, BS, Sociology; Hunter College, CUNY, 1972, MUP; Columbia University, 1979, PhD, Urban Planning.

Allison S. Rachleff, Architectural Historian: Over six years of experience in survey work, site plan mapping, archival research, and preservation plans, working in the context of preservation legislation, Section 106 reviews, National Register nominations, and HABS/HAER reports. Smith College, 1987, BA, Comparative Literature; Cornell University, 1994, MA, Historic Preservation Planning.

John A. Rollino, Ecologist: 3 years of experience in conducting wetlands delineations, researching historical and archaeological materials, database management, and ecological field work and

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APPENDIX A

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APPENDIX B

SOCIOECONOMIC DATA

Table B-1

Study Area Total Population

Census Tracts	1980	1990	Projection 2002	Change in Number 1980-90	Percent Change 1980-90	Change in Number 1990-2002	Percent Change 1990-2002
183	2,520	2,330	2,228	-190	-7.5	-102	-4.4
185.01	5,053	4,989	4,959	-64	-1.3	-30	-0.6
185.02	1,006	1,869	1,718	863	85.8	-151	-8.1
187	1,171	1,113	1,199	-58	-5.0	86	7.7
189	29	5	5	-24	-82.8	0	0
191	2,211	2,414	2,305	-203	9.2	-109	-4.5
193	4,065	4,644	4,532	579	14.2	-112	-2.4
195	3,858	4,031	4,145	173	4.5	114	2.8
235	2,040	2,107	1,754	67	3.3	-353	-16.8
237	1,297	1,386	1,280	89	6.9	-106	-7.6
239	500	517	392	17	3.4	-125	-24.2
531	1,647	1,771	1,591	124	7.5	-180	-10.2
533	6,588	7,228	6,997	640	9.7	-231	-3.2
535	4,144	4,716	4,556	572	13.8	-160	-3.4
537	1,306	1,630	1,577	324	24.8	-53	-3.3
539	3,792	4,951	5,149	1,159	30.6	198	4
543	113	0	0	-113	-100.0	0	0
545	5,754	6,222	6,537	468	8.1	315	5.1
Study Area	47,094	51,923	50,924	4,829	10.3	-999	-1.9
Brooklyn	2,230,936	2,300,664	2,229,323	69,728	3.1	-71,341	-3.1
New York City	7,071,639	7,322,564	7,370,399	250,925	3.5	47,835	0.7

Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995; Projections based on Claritas Data Services, Household Trend Report, 1997.

Table B-2

Age Characteristics

Census Tracts	Population					
	1980			1990		
	Percent Under 18	Percent Over 65	Median Age	Percent Under 18	Percent Over 65	Median Age
183	27	7	27.9	22	6	30.7
185.01	43.0	11	21.6	37.0	7	24.4
185.02	33	8	26	13	3	27.9
187	35	11	25.4	26	6	30.3
189	21	0	37.5	0	0	28.5
191	34.0	10	25.9	28.0	6	28.1
193	16.0	13	35.6	9.0	15	34.2
195	23	9	29.3	20	7	33.5
235	46.0	7	19.8	34.0	5	26.3
237	39.0	10	23.1	33.0	6	25.3
239	34.0	7	25.9	38.0	6	24.4
531	45.0	9	21.2	44.0	6	21.6
533	44.0	13	20.9	51.0	7	17.4
535	42.0	14	22.1	50.0	8	17.9
537	44.0	30	22.4	53.0	15	16.2
539	52.0	10	16.3	53.0	7	17.1
543	6.0	0	26.9	0.0	0	0
545	43.0	18	22.1	44.0	12	21.9
Study Area*	38.0	8	25.0	43.0	8	25.0
Brooklyn	28.0	12.5	30.9	26.0	12.4	32.3
New York City	25.0	13.5	32.8	23.0	13	33.7

Note: * Study Area "Median Age" is computed mean of tract medians.
Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995; Demographic Profiles, 1980, and 1990: 1992.

Table B-3

Ethnic Characteristics

Census Tracts	Population					Percent Change 1980-1990 Black	Percent Change 1980-1990 Hispanic
	1980		1990				
	Percent Black	Percent Hispanic	Percent Black	Percent Hispanic	Percent White Non-Hispanic		
183	53.0	25.5	56.3	23.1	21.5	-1.9	-16
185.01	80.3	20.5	81.4	23.4	1.2	0.1	12.7
185.02	26.3	60.8	56.2	44.9	4.7	296.6	37.3
187	39.5	40.1	49.2	37.5	15.7	18.6	-11.3
189	34.5	3.4	80	20	0	-60	0
191	42.9	41.8	48.7	39.4	15.5	23.9	2.9
193	65.4	12.5	57.3	15.2	24.5	0	39.2
195	59.2	12.5	64	16.3	20.8	13	36.8
235	38.4	59.6	39.4	62.2	3.3	5.9	7.9
237	15.0	68.2	16.6	79	7.6	18.6	23.7
239	35.8	54.4	48.0	57.1	6.6	38.5	8.5
531	3.9	61	6.9	55.6	41.6	92.2	-2.1
533	1.1	5.4	1.1	6	91.5	8.5	21.8
535	0.5	17.7	1.5	14.8	84.6	260	-5
537	5.4	9	0.7	3.6	93.4	-82.9	-50.4
539	6.1	18.8	4.6	15.6	80.2	-1.7	7.8
543	95.0	5	0	0	0	0	0
545	7.6	31.2	6.8	30.1	65.4	-2.5	4
Study Area	30.1	25	30.1	24.6	46.8	10.2	8.6
Brooklyn	30.9	17.6	34.7	20.1	40.1	15.89	17.6
New York City	24.0	19.9	25.2	24.4	43.2	-14.6	9

Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995.

Table B-4

1990 Census 1989 Income Data

Census Tracts	Median Household Income	Median Family Income	Per Capita Income	Persons Below Poverty Line		Families Below Poverty Line	
				Persons	Percent	Families	Percent
183	29,868	29,625	13,891	569	24.1	98	19.6
185.01	9,500	13,933	5,860	2,345	47.3	487	44.4
185.02	16,875	18,750	4,501	231	29.1	46	28.2
187	39,697	42,083	14,494	117	12.0	23	9.1
189	0	0	0	0	0.0	0	0
191	25,200	27,552	11,135	726	30.0	127	22.2
193	29,941	38,929	15,017	252	7.5	61	7.2
195	33,897	42,791	17,760	466	11.4	69	7
235	20,959	19,635	7,021	724	34.9	146	27.2
237	19,010	16,300	5,997	515	37.8	89	34.2
239	8,254	9,031	4,772	291	51.2	70	52.6
531	12,039	11,328	4,702	778	50.4	140	41.1
533	11,583	12,784	5,398	4,316	59.7	745	48.8
535	15,148	16,780	5,681	2,442	51.8	429	45.6
537	16,364	18,125	3,658	496	41.4	76	40.6
539	13,570	15,720	3,910	2,854	58.3	456	50.2
543	0	0	0	0	0.0	0	0
545	10,489	12,105	4,457	3,787	60.9	575	47.2
Study Area*	19,525	21,592	8,016	20,909	40.3	3,637	35.2
Brooklyn	25,684	30,033	12,318	521,330	22.6	109,811	19.5
New York City	29,823	34,360	16,230	1,412,523	19.3	285,476	16.3

Note: * Study Area "medians" and "per capita" are computed as means of the tracts for which data is provided.
Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995; Claritas Data Services, Household Trend Report, 1997.

Table B-5

Housing and Households

Census Tracts	All Housing Units			Total Households			Mean Household Size			
	1980	1990	Percent Change	1980	1990	Percent Change	1980	1990	Percent Change	Projection 2002
183	1,243	1,078	-13.3	1,103	1,000	-9.3	2.27	2.38	4.9	2.40
185.01	1,632	1,579	-3.3	1,592	1,557	-2.2	3.17	3.18	0.3	3.20
185.02	341	323	-5.3	315	250	-20.6	2.94	2.96	0.7	2.99
187	422	436	3.3	371	314	-15.4	3.16	3`	-5.1	3.02
189	20	2	-90.0	15	0	-100.0	1.93	0	-100	0.00
191	961	954	-0.7	814	820	0.7	2.72	2.77	1.8	2.79
193	1,766	1,926	9.1	1,737	1,872	7.8	1.93	1.85	-4.2	1.87
195	1,878	1,938	3.2	1,804	1,821	0.9	2.09	2.23	6.7	2.25
235	720	653	-9.3	606	636	5.0	3.34	3.44	3.0	3.47
237	565	453	-19.8	426	353	-17.1	3.04	3.44	13.2	3.47
239	220	197	-10.5	182	209	14.8	2.75	3.15	14.6	3.16
531	513	455	-11.3	448	359	-19.9	3.68	4.32	17.4	4.36
533	1,842	1,835	-0.4	1,722	1,732	0.6	3.83	4.24	10.7	4.28
535	1,285	1,255	-2.3	1,193	1,151	-3.5	3.47	4.10	18.2	4.13
537	282	278	-1.4	259	200	-22.8	4.29	5.55	29.4	5.00
539	882	1,046	18.6	854	1,030	20.6	4.44	4.79	7.9	4.69
543	13	0	-100	13	0	-100	2.46	0.00	-100	0
545	1,647	1,644	-0.2	1,593	1,629	2.3	3.61	3.81	5.5	3.34

Table B-5

Housing and Households

Census Tracts	All Housing Units			Total Households			Mean Household Size			
	1980	1990	Percent Change	1980	1990	Percent Change	1980	1990	Percent Change	Projection 2002
Study Area*	16,232	16,052	-1.1	15,047	14,933	-0.8	3.06	3.45	12.7	3.40
Brooklyn	881,367	873,671	-0.9	828,257	828,199	0.0	2.67	2.74	2.6	2.76
New York City	2,946,860	2,992,169	1.6	2,788,530	2,819,401	1.1	2.49	2.54	2.0	2.54

Note:* Study Area "Mean Household Size" is computed as the mean of tracts for which there is data.
Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995; Claritas Data Services, Household Trend Report, 1997.

Table B-6

Housing Characteristics

Census Tracts	Tenure 1990		Vacancy Rate 1990		1990 Median Housing	
	Percent Owner	Percent Renter	Percent for Sale	Percent for Rent	Value $	Rent $
183	18.5	81.5	3.72	9.01	237,500	563
185.01	2.4	97.6	5	0.39	175,000	191
185.02	18.6	81.4	3.92	12.96	114,300	383
187	28.6	71.4	4.5	14.24	145,000	502
189	0.0	0.0	100	100	--	--
191	25.4	74.6	2.63	8.05	158,300	462
193	46.4	53.6	2.71	1.68	--	372
195	22.9	77.1	2.13	6.07	290,000	455
235	16.7	83.3	1.92	3.8	106,300	386
237	17.9	82.1	4	4.61	158,300	368
239	12.2	87.8	13.04	12.2	112,500	347
531	22.4	77.6	0	5.07	95,000	389
533	19.9	80.1	0.29	6.77	137,500	372
535	13.2	86.8	0.65	4.68	137,500	361
537	29.0	71.0	0	9.36	112,500	470
539	9.3	90.7	0	1.37	30,000	268
543	0	0	0	0	--	--
545	0.3	99.7	0	0.73	--	221
Study Area*	18.7	81.3	2.2	4.5	143,550	377
Brooklyn	25.9	74.1	2.8	5.2	196,100	428
New York City	17.9	82.1	2.9	5.8	189,600	448

Note: * Study Area "Median Values" and "Median Rents" are computed from the mean of the census tracts for which there is data.
Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995; Demographic Profiles, 1980, and 1990, NYC Dept. Of Planning, 1992.

Table B-7

Resident Labor Force and Employment 1990

Census Tracts	Labor Force	Percent in Labor Force	Civilian Labor Force	
			Employed	Percent Unemployed
183	1,877	68.6	1,212	5.8
185.01	3,330	48.0	1,260	21.2
185.02	1,650	20.3	248	26
187	743	74.2	468	15.1
189	--	--	--	--
191	1,779	66.2	1,009	12.6
193	4,148	48.9	1,889	6.9
195	3,400	78.1	2,430	8.5
235	1,409	59.5	743	10.5
237	972	56.4	421	23.2
239	381	50.7	187	3.1
531	874	44.9	332	15.3
533	3,783	44.6	1,597	5.3
535	2,480	45.1	1,044	6.7
537	710	33.0	234	0
539	2,494	40.1	906	9.5
543	--	--	--	--
545	3,733	37.7	1,283	8.9
Study Area	33,763	50.5	15,263	10.32
Brooklyn	1,760,921	58.3	929,335	10.3
New York City	5,817,015	61.5	3,257,637	9

Sources: US Census, 1980, and 1990, CP-1-40 and CPH-3; NYC Community District Needs, Brooklyn, 1995.

Table B-8

Personal Income and Earnings by Industry, Kings County (Thousands of Dollars)

Economic Category	1993	1994	1995
Personal Income	43,987,896	46,070,867	48,639,206
Per Capita Personal Income (dollars)	19,196	20,135	21,328
Earnings by Industry			
Ag., Forestry, & Fishing	45,059	45,280	46,688
Mining	611	642	860
Construction	708,491	765,205	838,203
Manufacturing	1,513,854	1,507,848	1,448,016
Transportation & Public Utilities	1,109,450	1,165,723	1,184,046
Wholesale Trade	927,042	974,419	1,043,301
Retail Trade	1,224,275	1,246,772	1,292,406
Finance, Insurance, & Real Estate	1,171,027	1,188,659	1,241,945
Services	5,806,326	6,142,000	6,494,222
Government	1,588,334	1,677,237	1,660,804
Total Nonfarm Earnings	14,094,469	14,713,785	15,250,491
Source: US Bureau of Economic Analysis Regional Economic Information System 1996.			

Table B-9

Employees by Major Industry, Kings County (Number of Jobs)

Employment Category	1993		1994		1995	
	Jobs	Percent	Jobs	Percent	Jobs	Percent
Total Employment	559,111	100.0	561,838	100.0	564,668	100.0
Ag., Forestry, & Fishing	1,735	0.3	1,780	0.3	1,843	0.3
Mining	104	0.0	91	0.0	96	0.0
Construction	24,223	4.3	25,302	4.5	26,451	4.7
Manufacturing	59,392	10.6	58,184	10.4	55,555	9.8
Trans. & Public Utilities	33,924	6.1	34,897	6.2	34,934	6.2
Wholesale Trade	29,494	5.3	30,380	5.4	31,462	5.6
Retail Trade	71,958	12.9	72,615	12.9	74,146	13.1
Finance, Ins., & Real Estate	48,600	8.7	48,287	8.6	47,198	8.4
Services	243,628	43.6	245,413	43.7	251,611	44.6
Government	46,053	8.2	44,889	8.0	42,371	7.5
Source: US BEA RIMS 1996.						

APPENDIX C

COMMUNITY FACILITIES DATA

Table C-1

Public School Characteristics

Name	Address	District	Enrollment 1996-1997		Capacity	Utilization %
			Grades	Total		
PS 16 Leonard Dunkly School	157 Wilson St	14	PK-6	716	1046	68
PS 380	370 Marcy Ave	14	PK-5	703	769	91
PS 20 Clinton Hill School	225 Adelphi St	13	K-6	1041	1033	101
PS 46 Edward C. Blum School	100 Clermont Ave	13	PK-6	715	960	74
PS 270 Dekalb School	400 Dekalb Ave	13	PK-6	613	723	85
IS 265 S.S. McKinney	101 Park Ave	13	6-8	765	1150	67
PS 157 Franklin School	850 Kent Ave	14	PK-5	549	775	71
IS 117 FS Key	300 Willoughby Ave	13	7-8	622	1040	60
Benjamin Banneker Academy for Community Development	77 Clinton Ave	13	7-12	409	975	42

Source: NYC Board of Education, School Facilities, 1996-1997.

Table C-2

Private and Parochial School Characteristics

Name	Address	Enrollment 1995		
		District	Grade Type	Total
Bais Yaakov Dkhal Adas Veriem	563 Bedford Ave	14	Elementary	225
Be Ikvei Hatzoin	31 Division Ave	14	Elementary	234
Bnos Chavil	111 Lee Ave	14	Elementary	38
Talmud Torah Toldos Hillel-Krasna	631 Bedford Ave	14	Elementary	329
United Talmudical Acad	227 Marcy Ave	14	Elementary	2,729
Yeshiva Bnos Spinka	192 Keap St	14	Elementary	40
Yeshiva Yesode Hatorah	131 Lee Ave	14	Elementary	188
Yeshiva Yesode Hatorah	505 Bedford Ave	14	Elementary	196
Meshiva Beth Yehuda Chaim DBetlan	52-62 Keap St	14	Junior/Senior HS	195
Yeshiva Beth Yitzchok D. Spinka	575 Bedford Ave	14	Junior/Senior HS	177
Yeshiva Mesivta Arugath Habosem	40 Lynch St	14	Elementary	250
Yeshiva Bnos Ahavas Israel	12 Franklin Ave	14	K-12	665
Meshiva Nachlas Yacovha Yerim	185 Wilson St	14	High School	57
Yeshiva Bnai Vesucher Ber	467 Bedford Ave	14	High School	29
Beth Chana School for Girls	620 Bedford Ave	14	K-12	317
Bnos Chayil	670 Bedford Ave	14	Elementary	148
Beth Rachel School for Girls	227 Marcy St	14	K-12	3,471
Bnei Shimon Yisroel of Sopron	215 Hewes St	14	K-12	385
Bnos Yakov School for Girls	206 Wilson St	14	K-12	913
Talmud Torah Toldos Yakov Yosef	105 Heyward St	14	K-12	331
Yeshiva Ahavas Israel	6 Lee Ave	14	K-12	644
Yeshiva Kehilah Yakov	206 Wilson St	14	K-12	629
Dillon Child Study Center	St. Joseph's College	13	Elementary	101
St. Angela Hall ES	290 Washington Ave	13	Elementary	120
Source: NYC Department of City Planning, Selected Facilities & Program Sites, 1995.				

Table C-3

Hospital Characteristics

Name	Address	Number of Beds	Annual Occupancy Rate
Brooklyn Hospital	121 Dekalb Ave	463	80-85%
Woodhull Hospital	760 Broadway	533	100%
Source: Personal interviews with representatives of each facility, October 1997.			

Table C-4

Library Characteristics

Name	Address	Circulation 1995
Williamsburg	240 Division Ave	116,983
Clinton Hill	380 Washington Ave	93,790
Walt Whitman	93 St. Edwards St	42,347
Marcy	617 Dekalb Ave	413
Source: NYC Department of City Planning, Selected Facilities & Program Sites, 1995.		

Table C-5

Day Care Facilities

Name	Address	Facility Type[1]	Capacity (1995)
YM-YWHA of Williamsburg Inc	64-70 Division Ave	Head Start Center	178
Torah DCC	2 Lee Ave	Group Day Care	35
Graham-Windham CCC	110 Taylor St	Group Day Care	55
Yeshivath Kehilah Yakov HS	206 Wilson St	Head Start Center	57
Yeled V' Yalda HS Center	563 Bedford Ave	Head Start Center	45
Yeled V' Yalda HS Center	204 Keap St	Head Start Center	58
Howard O Walker DCC	38 Lynch Stt	Group Day Care	145
Yeled V' Yalda HS Center	12 Franklin Ave	Head Start Center	88
Willoughby Waverly DCC	143 Waverly Ave	Group Day Care	200
BBCS Child CCC	105 N Portland Ave	Group Day Care	135
Oasis For Children	170 Adelphi St	Daycare (Voucher)	7
Marcy Childrens Center	494 Marcy Ave	Group Day Care	55
David T Bradley Mem DDC	172 Franklin Ave	Group Day Care	130
Total			1,188

Notes: [1]All facility types listed are public.
Source: NYC Department of City Planning, Selected Facilities & Program Sites, 1995.

APPENDIX D

TRAFFIC LEVEL OF SERVICE ANALYSIS

Table D-1

Summary of LOS Analysis – Existing Conditions

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Williamsburg Street West and Kent Avenue (Location 2)								
WB LTR	612	0.250	9.7	B	563	0.230	9.6	B
NB L	119	0.238	13.9	B	115	0.300	14.4	B
NB T	390	0.294	14.3	B	357	0.269	14.1	B
SB T	130	0.093	13.0	B	239	0.171	13.5	B
Overall		0.270	11.8	B		0.261	12.0	B
Kent Avenue and Classon/Rutledge Street (Location 3)								
EB L	789	0.359	12.6	B	749	0.353	12.6	B
EB TR	60	0.381	12.7	B	70	0.364	12.6	B
NB TR	516	0.285	12.0	B	347	0.192	11.4	B
SB L	5	0.019	10.5	B	9	0.025	10.5	B
SB T	138	0.092	10.8	B	187	0.126	11.0	B
Overall		0.333	12.3	B		0.278	12.0	B
Williamsburg Street West and Flushing Avenue (Location 4)								
WB LTR	1062	0.491	14.0	B	1026	0.477	13.9	B
NB L	294	0.569	14.9	B	287	0.795	23.9	C
NB T	216	0.248	11.4	B	146	0.168	10.9	B
SB TR	199	0.126	10.7	B	364	0.233	11.3	B
Overall		0.530	13.5	B		0.639	14.6	B

Table D-1 (Cont.)

Summary of LOS Analysis – Existing Conditions

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Classon Avenue and Flushing Avenue (Location 5)								
EB LTR	1026	0.467	13.8	B	1066	0.500	14.1	B
NB TR	533	0.618	15.2	C	361	0.417	12.7	B
SB LT	194	0.728	18.7	C	337	0.615	14.0	B
Overall		0.600		B		0.559	13.8	B
Flushing Avenue and Clinton Avenue (Location 6)								
EB LTR	228	0.254	4.5	A	319	0.286	4.6	A
WB LTR	674	0.575	6.1	B	403	0.347	4.9	A
NB LTR	89	0.142	7.9	B	54	0.089	7.7	B
SB LTR	53	0.076	7.7	B	122	0.166	8.0	B
Overall		0.402	6.0	B		0.275	5.4	B
Park Avenue West and Clinton Avenue (Location 7)								
WB LTR	1085	0.456	6.8	B	784	0.330	6.0	B
NB LT	128	0.141	18.8	C	75	0.100	18.5	C
SB TR	48	0.083	18.4	C	87	0.145	18.8	C
Overall		0.355	8.4	B		0.271	8.1	B
Park Avenue East and Clinton Avenue (Location 8)								
EB LTR	497	0.204	5.4	B	870	0.358	6.2	B
NB TR	135	0.218	19.3	C	88	0.148	18.8	C
SB LT	59	0.094	18.5	C	117	0.174	19.0	C
Overall		0.209	9.1	B		0.299	8.5	B

Table D-1 (Cont.)

Summary of LOS Analysis – Existing Conditions

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Clymer Avenue and Kent Avenue (Location 9)								
EB LTR	78	0.206	15.8	C	125	0.328	16.5	C
WB LTR	130	0.178	15.5	C	134	0.245	15.8	C
NB L	65	0.170	3.6	A	39	0.127	3.5	A
NB LT	415	0.229	3.7	A	401	0.245	3.8	A
SB TR	387	0.308	4.0	A	485	0.385	4.3	A
Overall		0.279	6.3	B		0.369	6.8	B
Williamsburg Street West and Wythe Avenue (Location 10)								
WB LTR	949	0.361	8.2	B	985	0.376	8.3	B
SB TR	222	0.163	16.2	C	207	0.150	16.1	C
Overall		0.285	9.6	B		0.290	9.6	B
Williamsburg Street East and Wythe Avenue (Location 11)								
EB TR	856	0.573	14.6	B	720	0.480	13.6	B
EB R	1	0.001	10.4	B	5	0.007	10.4	B
SB L	110	0.138	11.1	B	120	0.150	11.2	B
SB LT	415	0.179	11.3	B	514	0.231	11.6	B
Overall		0.376	13.5	B		0.356	12.7	B
Park Avenue and Classon Avenue (Location 12)								
EB DFL	174	1.342	*	F	185	1.057	*	F
EB T	171	0.199	6.8	B	273	0.317	7.4	B
WB TR	564	0.546	9.0	B	462	0.450	8.2	B

Table D-1 (Cont.)

Summary of LOS Analysis – Existing Conditions

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Park Avenue and Classon Avenue (Location 12), con't.								
NB LTR	465	0.310	11.3	B	352	0.236	10.9	B
Overall		*	*	B		*	*	B
Flushing Avenue and Navy Street (Location 13)								
EB LTR	58	0.049	5.1	B	97	0.082	5.2	B
WB LTR	987	0.741	10.8	B	500	0.385	6.6	B
NB LTR	445	0.355	20.1	C	500	0.359	20.1	C
SB LTR	143	0.187	18.9	C	401	1.317	*	F
Overall		0.615	14.0	B		*	*	F
Park Avenue West and Navy Street (Location 14)								
WB LTR	930	0.441	9.1	B	595	0.285	8.0	B
NB LT	258	0.238	16.3	C	227	0.267	16.5	C
SB T	157	0.121	15.5	C	375	0.291	16.7	C
Overall		0.362	11.2	B		0.287	12.5	B
Park Avenue East and Navy Street (Location 15)								
EB LT	323	0.152	7.3	B	573	0.268	7.9	B
NB T	218	0.168	15.8	C	235	0.181	15.9	C
SB LT	266	0.255	16.4	C	445	0.444	18.0	C
Overall		0.192	12.6	B		0.337	13.0	B

Note: EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound
L=Left, R=Right, T=Through
* Indicates an approach that is expected to operate at a volume/capacity ratio greater than 1:2. In such cases, the stopped delay is not calculated, but LOS is F.

Table D-2

Summary of LOS Analysis – No Action Alternative

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Williamsburg Street West and Kent Avenue (Location 2)								
WB LTR	643	0.264	9.8	B	591	0.242	9.7	B
NB L	126	0.274	14.2	B	123	0.330	14.7	B
NB T	426	0.320	14.5	B	407	0.306	14.4	B
SB T	164	0.118	13.2	B	254	0.181	13.5	B
Overall		0.289	12.0	B		0.281	12.2	B
Classon/Rutledge Street and Kent Avenue (Location 3)								
EB L	851	0.387	12.9	B	820	0.383	12.8	B
EB LTR	64	0.410	13.0	B	75	0.399	12.9	B
NB TR	543	0.300	12.1	B	368	0.203	11.5	B
SB L	5	0.020	10.5	B	9	0.026	10.5	B
SB T	148	0.099	10.9	B	196	0.131	11.0	B
Overall		0.355	12.4	B		0.301	12.2	B
Williamsburg Street West and Flushing Avenue (Location 4)								
WB LTR	1125	0.529	14.4	B	1090	0.507	14.2	B
NB DfL	309	0.621	15.9	C	303	0.892	34.1	D
NB T	231	0.266	11.5	B	155	0.178	11.0	B
SB TR	214	0.136	10.7	B	392	0.250	11.4	B
Overall		0.576	13.9	B		0.703	16.3	C

Table D-2 (Cont.)

Summary of LOS Analysis – No Action Alternative

Intersection	AM Peak Hour				PM Peak Hour			
	Appr Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Classon Avenue and Flushing Avenue (Location 5)								
EB LTR	1086	0.494	14.0	B	1140	0.534	14.4	B
NB TR	551	0.641	15.6	C	387	0.448	13.0	B
SB DfL	106	0.867	45.9	E	177	0.745	23.4	C
SB T	106	0.125	10.7	B	187	0.219	11.2	B
Overall		0.684	16.0	C		0.642	14.7	B
Flushing Avenue and Clinton Avenue (Location 6)								
EB LTR	246	0.282	4.6	A	345	0.311	4.7	A
WB LTR	712	0.608	6.4	B	426	0.368	4.9	A
NB LTR	94	0.151	7.9	B	57	0.094	7.7	B
SB LTR	56	0.081	7.7	B	128	0.175	8.0	B
Overall		0.425	6.2	B		0.291	5.4	B
Park Avenue West and Clinton Avenue (Location 7)								
WB LTR	1145	0.481	7.0	B	825	0.347	6.1	B
NB LT	134	0.148	18.8	C	–	–	–	–
NB DfL	–	–	–	–	37	0.108	18.6	C
NB T	–	–	–	–	42	0.076	18.4	C
SB TR	51	0.087	18.5	C	92	0.153	18.9	C
Overall		0.374	8.6	B		0.285	8.2	B
Park Avenue East and Clinton Avenue (Location 8)								
EB LTR	522	0.214	5.5	B	924	0.380	6.3	B
NB TR	145	0.236	19.4	C	97	0.163	18.9	C
SB LT	62	0.100	18.5	C	123	0.186	19.1	C
Overall		0.221	9.2	B		0.318	8.6	B

Table D-2 (Cont.)

Summary of LOS Analysis – No Action Alternative

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Clymer Avenue and Kent Avenue (Location 9)								
EB LTR	82	0.217	15.9	C	131	0.344	16.6	C
WB DfL	108	0.219	15.9	C	122	0.294	16.3	C
WB TR	45	0.072	15.2	C	32	0.049	15.1	C
NB L	68	0.195	3.7	A	41	0.168	3.6	A
NB LT	369	0.242	3.8	A	382	0.250	3.8	A
SB TR	406	0.324	4.1	A	509	0.405	4.4	A
Overall		0.294	6.5	B		0.387	7.0	B
Williamsburg Street West and Wythe Avenue (Location 10)								
WB LTR	996	0.379	8.3	B	1035	0.394	8.4	B
SB TR	249	0.182	16.3	C	241	0.167	16.2	C
Overall		0.304	9.8	B		0.308	9.8	B
Williamsburg Street East and Wythe Avenue (Location 11)								
EB TR	909	0.610	15.1	C	758	0.508	13.9	B
EB R	1	0.001	10.4	B	5	0.007	10.4	B
SB L	130	0.163	11.2	B	136	0.107	11.3	B
SB LT	322	0.189	11.4	B	416	0.244	11.7	B
Overall		0.399	13.8	B		0.376	12.9	B
Park Avenue and Classon Avenue (Location 12)								
EB DfL	189	1.735	*	F	209	1.239	*	F
EB T	180	0.209	6.9	B	287	0.334	7.5	B
WB TR	592	0.574	9.3	B	485	0.472	8.4	B
NB LTR	492	0.328	11.4	B	375	0.252	11.0	B
Overall		*	*	F		*	*	F

Table D-2 (Cont.)

Summary of LOS Analysis – No Action Alternative

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Flushing Avenue and Navy Street (Location 13)								
EB LTR	63	0.053	5.1	B	107	0.090	5.2	B
WB LTR	1041	0.781	11.9	B	527	0.406	6.7	B
NB LTR	469	0.377	20.3	C	525	0.377	20.3	C
SB LTR	154	0.205	19.0	C	–	–	–	–
SB DfL	–	–	–	–	239	1.491	*	F
SB TR	–	–	–	–	187	0.334	20.0	C
Overall		0.649	14.7	B		*	*	F
Park Avenue West and Navy Street (Location 14)								
WB LTR	980	0.465	9.2	B	626	0.300	8.1	B
NB LT	271	0.250	16.4	C	273	0.284	16.6	C
SB T	165	0.128	15.6	C	394	0.306	16.8	C
Overall		0.381	11.4	B		0.302	12.5	B
Park Avenue East and Navy Street (Location 15)								
EB LT	342	0.161	7.4	B	606	0.284	8.0	B
NB T	229	0.177	15.9	C	247	0.191	16.0	C
SB LT	280	0.272	16.5	C	467	0.474	18.3	C
Overall		0.204	12.7	B		0.358	13.1	B

Note: EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound
L=Left, R=Right, T=Through
* Indicates an approach that is expected to operate at a volume/capacity ratio greater than 1:2. In such cases, the stopped delay is not calculated, but LOS is F.
– Indicates an unsignalized intersection.

Table D-3

Summary of LOS Analysis – Reuse Plan

Intersection	AM Peak Hour				PM Peak Hour			
	Appr Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Williamsburg Street West and Kent Avenue (Location 2)								
WB LTR	893	0.365	10.5	B	739	0.303	10.0	B
NB L	126	0.295	14.4	B	123	0.377	15.2	C
NB T	426	0.320	14.5	B	407	0.306	14.4	B
SB T	195	0.139	13.3	B	313	0.223	13.8	B
Overall		0.345	12.1	B		0.336	12.2	B
Classon/Rutledge Street and Kent Avenue (Location 3)								
EB L	961	0.436	13.3	B	1030	0.476	13.7	B
EB LTR	64	0.458	13.4	B	75	0.491	13.7	B
NB TR	543	0.300	12.1	B	368	0.203	11.5	B
SB L	5	0.020	10.5	B	9	0.026	10.5	B
SB T	148	0.099	10.9	B	196	0.131	11.0	B
Overall		0.379	12.7	B		0.347	12.9	B
Williamsburg Street West and Flushing Avenue (Location 4)								
WB LTR	1376	0.662	16.0	C	1239	0.585	15.0	B
NB LT	1021	1.023	45.9	E	–	–	–	–
NB DfL	–	–	–	–	303	3.389	*	F
NB T	–	–	–	–	441	0.507	13.7	B
SB TR	482	0.303	11.8	B	905	0.571	14.2	B
Overall		0.846	25.6	D		*	*	F

Table D-3 (Cont.)

Summary of LOS Analysis – Reuse Plan

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Classon Avenue and Flushing Avenue (Location 5)								
EB LTR	1507	0.691	16.4	C	1390	0.651	15.8	C
NB TR	611	0.711	17.1	C	423	0.489	13.5	B
SB DfL	217	2.473	*	F	387	1.934	*	F
SB T	132	0.155	10.8	B	238	0.279	11.6	B
Overall		*	*	F		*	*	F
Flushing Avenue and Clinton Avenue (Location 6)								
EB LTR	246	0.290	4.7	A	345	0.354	4.9	A
WB LTR	853	0.876	13.5	B	695	1.039	45.3	E
NB LTR	295	0.479	9.5	B	176	0.289	8.4	B
SB LTR	56	0.094	7.7	B	128	0.191	8.0	B
Overall		0.717	11.0	B		0.739	26.6	D
Park Avenue West and Clinton Avenue (Location 7)								
WB LTR	1156	0.481	7.0	B	825	0.347	6.1	B
NB LT	345	0.419	20.8	C	198	0.280	19.7	C
SB TR	192	0.325	20.1	C	361	0.608	23.3	C
Overall		0.461	11.2	B		0.431	12.4	B
Park Avenue East and Clinton Avenue (Location 8)								
EB LTR	602	0.249	5.6	B	972	0.400	6.4	B
NB TR	266	0.427	20.9	C	168	0.275	19.7	C
SB LT	168	0.272	19.7	C	325	0.477	21.4	C
Overall		0.306	11.7	B		0.425	11.1	B

Table D-3 (Cont.)

Summary of LOS Analysis – Reuse Plan

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Clymer Avenue and Kent Avenue (Location 9)								
EB LTR	82	0.217	15.9	C	130	0.344	16.6	C
WB DfL	108	0.219	15.9	C	122	0.294	16.3	C
WB TR	45	0.072	15.2	C	32	0.049	15.1	C
NB L	68	0.195	3.7	A	41	0.169	3.6	A
NB LT	369	0.242	3.8	A	382	0.250	3.8	A
SB TR	406	0.324	4.1	A	509	0.405	4.4	A
Overall		0.294	6.5	B		0.387	7.0	B
Williamsburg Street West and Wythe Avenue (Location 10)								
WB LTR	1317	0.498	9.2	B	1226	0.465	8.9	B
SB TR	249	0.182	16.3	C	231	0.167	16.2	C
Overall		0.378	10.3	B		0.351	10.0	B
Williamsburg Street East and Wythe Avenue (Location 11)								
EB TR	1050	0.704	16.5	C	1027	0.688	16.2	C
EB R	1	0.001	10.4	B	5	0.007	10.4	B
SB L	130	0.163	11.2	B	136	0.170	11.3	B
SB LT	322	0.189	11.4	B	416	0.244	11.7	B
Overall		0.446	15.0	B		0.466	14.6	B
Park Avenue and Classon Avenue (Location 12)								
EB DfL	189	1.732	*	F	209	1.237	*	F
EB T	180	0.209	6.9	B	287	0.334	7.5	B
WB TR	592	0.574	9.3	B	485	0.472	8.4	B
NB LTR	612	0.406	11.9	B	446	0.298	11.3	B
Overall		*	*	F		*	*	F

Table D-3 (Cont.)

Summary of LOS Analysis – Reuse Plan

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volme	V/C Ratio	Stopped Delay	LOS	Appr. Volme	V/C Ratio	Stopped Delay	LOS
Flushing Avenue and Navy Street (Location 13)								
EB LTR	63	0.053	5.1	B	107	0.090	5.2	B
WB LTR	1041	0.782	11.9	B	527	0.406	6.7	B
NB LTR	469	0.377	20.3	C	525	0.377	20.3	C
SB LTR	154	0.205	19.0	C	–	–	–	–
SB DfL	–	–	–	–	239	1.490	*	F
SB TR	–	–	–	–	187	0.334	20.0	C
Overall		0.649	14.7	B		*	*	F
Park Avenue West and Navy Street (Location 14)								
WB LTR	1015	0.480	9.4	B	693	0.331	8.3	B
NB LT	271	0.250	16.4	C	273	0.284	16.6	C
SB T	165	0.128	15.6	C	394	0.306	16.8	C
Overall		0.390	11.4	B		0.321	12.4	B
Park Avenue East and Navy Street (Location 15)								
EB LT	422	0.198	7.6	B	654	0.306	8.1	B
NB T	229	0.177	15.9	C	247	0.191	16.0	C
SB LT	280	0.272	16.5	C	467	0.474	18.3	C
Overall		0.227	12.3	B		0.371	13.0	B

Note: EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound
L=Left, R=Right, T=Through
* Indicates an approach that is expected to operate at a volume/capacity ratio greater than 1:2. In such cases, the stopped delay is not calculated, but LOS is F.
– Indicates an unsignalized intersection.

Table D-4

Summary of LOS Analysis – Residential Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Williamsburg Street West and Kent Avenue (Location 2)								
WB LT	833	0.341	10.3	B	689	0.282	9.9	B
NB L	126	0.293	14.4	B	123	0.368	15.1	C
NB T	426	0.320	14.5	B	407	0.306	14.4	B
SB T	191	0.136	13.3	B	302	0.216	13.8	B
Overall		0.332	12.1	B		0.321	12.2	B
Classon/Rutledge Street and Kent Avenue (Location 3)								
EB L	948	0.430	13.3	B	992	0.463	13.6	B
EB LTR	64	0.453	13.3	B	75	0.472	13.5	B
NB TR	543	0.300	12.1	B	368	0.203	11.5	B
SB L	5	0.020	10.5	B	9	0.026	10.5	B
SB T	148	0.099	10.9	B	196	0.131	11.0	B
Overall		0.376	12.7	B		0.337	12.8	B
Williamsburg Street West and Flushing Avenue (Location 4)								
WB LTR	1316	0.631	15.5	C	1189	0.559	14.7	B
NB LT	907	0.906	25.5	D	–	–	–	–
NB DfL	–	–	–	–	303	2.561	*	F
NB T	–	–	–	–	345	0.397	12.6	B
SB TR	450	0.283	11.6	B	812	0.513	13.5	B
Overall		0.771	18.2	C		*	*	F

Table D-4 (Cont.)

Summary of LOS Analysis – Residential Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Classon Avenue and Flushing Avenue (Location 5)								
EB LTR	1407	0.644	15.7	C	1306	0.612	15.3	C
NB TR	597	0.694	16.7	C	411	0.475	13.3	B
SB DfL	203	2.121	*	F	349	1.649	*	F
SB T	129	0.151	10.8	B	228	0.267	11.5	B
Overall		*	*	F		*	*	F
Flushing Avenue and Clinton Avenue (Location 6)								
EB LTR	246	0.290	4.7	A	345	0.344	4.9	A
WB LTR	836	0.841	11.5	B	647	0.891	16.5	C
NB LTR	247	0.401	9.0	B	136	0.224	8.2	B
SB LTR	56	0.091	7.7	B	128	0.186	8.0	B
Overall		0.665	9.7	B		0.624	11.5	B
Park Avenue West and Clinton Avenue (Location 7)								
WB LTR	1161	0.488	7.0	B	825	0.347	6.1	B
NB LT	287	0.346	20.2	C	158	0.218	19.3	C
SB TR	175	0.296	19.8	C	313	0.528	22.1	C
Overall		0.443	10.7	B		0.405	11.5	B
Park Avenue East and Clinton Avenue (Location 8)								
EB LTR	583	0.241	5.6	B	956	0.393	6.4	B
NB TR	237	0.380	20.5	C	144	0.238	19.4	C
SB LT	155	0.240	19.4	C	289	0.424	20.9	C
Overall		0.286	11.2	B		0.403	10.6	B

Table D-4 (Cont.)

Summary of LOS Analysis – Residential Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Clymer Avenue and Kent Avenue (Location 9)								
EB LTR	82	0.217	15.9	C	131	0.344	16.6	C
WB DfL	108	0.219	15.9	C	122	0.294	16.3	C
WB TR	45	0.072	15.2	C	32	0.049	15.1	C
NB L	68	0.195	3.7	A	41	0.169	3.6	A
NB LT	369	0.242	3.8	A	382	0.250	3.8	A
SB TR	406	0.324	4.1	A	509	0.405	4.4	A
Overall		0.294	6.5	B		0.387	7.0	B
Williamsburg Street West and Wythe Avenue (Location 10)								
WB LTR	1241	0.470	8.9	B	1162	0.441	8.7	B
SB TR	249	0.182	16.3	C	231	0.167	16.2	C
Overall		0.360	10.1	B		0.337	9.9	B
Williamsburg Street East and Wythe Avenue (Location 11)								
EB TR	1033	0.692	16.3	C	978	0.655	15.7	C
EB R	1	0.001	10.4	B	5	0.007	10.4	B
SB L	130	0.163	11.2	B	136	0.170	11.3	B
SB LT	322	0.189	11.4	B	416	0.244	11.7	B
Overall		0.441	14.8	B		0.450	14.2	B
Park Avenue and Classon Avenue (Location 12)								
EB DfL	189	1.732	*	F	209	1.237	*	F
EB T	180	0.209	6.9	B	287	0.334	7.5	B
WB TR	592	0.574	9.3	B	485	0.472	8.4	B
NB LTR	584	0.389	11.8	B	422	0.283	11.2	B
Overall		*	*	F		*	*	F

Table D-4 (Cont.)

Summary of LOS Analysis – Residential Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Flushing Avenue and Navy Street (Location 13)								
EB LTR	63	0.053	5.1	B	107	0.090	5.2	B
WB LTR	1041	0.782	11.9	B	527	0.406	6.7	B
NB LTR	469	0.377	20.3	C	525	0.377	20.3	C
SB LTR	154	0.205	19.0	C	–	–	–	–
SB DfL	–	–	–	–	239	1.490	*	F
SB TR	–	–	–	–	187	0.334	20.0	C
Overall		0.649	14.7	B		*	*	F
Park Avenue West and Navy Street (Location 14)								
WB LTR	1011	0.478	9.4	B	681	0.325	8.3	B
NB LT	271	0.250	16.4	C	273	0.284	16.6	C
SB T	165	0.128	15.6	C	394	0.306	16.8	C
Overall		0.389	11.4	B		0.318	12.4	B
Park Avenue East and Navy Street (Location 15)								
EB LT	403	0.189	7.5	B	638	0.298	8.1	B
NB T	229	0.177	15.9	C	247	0.191	16.0	C
SB LT	280	0.272	16.5	C	467	0.474	18.3	C
Overall		0.221	12.4	B		0.367	13.0	B

Note: EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound
L=Left, R=Right, T=Through
* Indicates an approach that is expected to operate at a volume/capacity ratio greater than 1:2. In such cases, the stopped delay is not calculated, but LOS is F.
– Indicates an unsignalized intersection.

Table D-5

Summary of LOS Analysis – Museum Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Williamsburg Street West and Kent Avenue (Location 2)								
WB LT	755	0.309	10.1	B	618	0.253	9.7	B
NB L	126	0.279	14.3	B	123	0.353	14.9	B
NB T	426	0.320	14.5	B	407	0.306	14.4	B
SB T	171	0.122	13.2	B	282	0.202	13.7	B
Overall		0.314	12.0	B		0.297	12.2	B
Classon/Rutledge Street and Kent Avenue (Location 3)								
EB L	875	0.397	12.9	B	919	0.429	13.2	B
EB LTR	64	0.421	13.0	B	75	0.441	13.2	B
NB TR	543	0.300	12.1	B	368	0.203	11.5	B
SB L	5	0.020	10.5	B	9	0.026	10.5	B
SB T	148	0.099	10.9	B	196	0.131	11.0	B
Overall		0.360	12.5	B		0.322	12.5	B
Williamsburg Street West and Flushing Avenue (Location 4)								
WB LTR	1238	0.589	15.0	B	1118	0.522	14.3	B
NB LT	757	0.682	16.0	C	–	–	–	–
NB DfL	–	–	–	–	303	1.540	*	F
NB TR	–	–	–	–	209	0.241	11.4	B
SB TR	273	0.173	10.9	B	634	0.401	12.5	B
Overall		0.636	14.9	B		*	*	F

Table D-5 (Cont.)

Summary of LOS Analysis – Museum Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Classon Avenue and Flushing Avenue (Location 5)								
EB LTR	1276	0.583	14.9	B	1187	0.556	14.7	B
NB TR	578	0.672	16.2	C	394	0.456	13.1	B
SB DfL	130	1.197	*	F	276	1.210	*	F
SB T	112	0.131	10.7	B	211	0.247	11.4	B
Overall		*	*	F		*	*	F
Flushing Avenue and Clinton Avenue (Location 6)								
EB LTR	246	0.287	4.7	A	345	0.324	4.8	A
WB LTR	743	0.660	7.0	B	553	0.645	7.1	B
NB LTR	184	0.298	8.4	B	80	0.132	7.9	B
SB LTR	56	0.086	7.7	B	128	0.178	8.0	B
Overall		0.516	6.8	B		0.458	6.5	B
Park Avenue West and Clinton Avenue (Location 7)								
WB LTR	1161	0.488	7.0	B	825	0.347	6.1	B
NB LT	229	0.250	19.5	C	102	0.133	18.7	C
SB TR	82	0.139	18.8	C	219	0.367	20.4	C
Overall		0.412	9.6	B		0.354	9.9	B
Park Avenue East and Clinton Avenue (Location 8)								
EB LTR	558	0.230	5.5	B	933	0.383	6.3	B
NB TR	199	0.320	20.0	C	111	0.185	19.1	C
SB LT	85	0.137	18.8	C	220	0.323	20.0	C
Overall		0.259	10.1	B		0.364	9.7	B

Table D-5 (Cont.)

Summary of LOS Analysis – Museum Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Clymer Avenue and Kent Avenue (Location 9)								
EB LTR	82	0.217	15.9	C	131	0.344	16.6	C
WB DfL	108	0.219	15.9	C	122	0.294	16.3	C
WB TR	45	0.072	15.2	C	32	0.049	15.1	C
NB L	68	0.195	3.7	A	41	0.169	3.6	A
NB LT	369	0.242	3.8	A	382	0.250	3.8	A
SB TR	406	0.324	4.1	A	509	0.405	4.4	A
Overall		0.294	6.5	B		0.387	7.0	B
Williamsburg Street West and Wythe Avenue (Location 10)								
WB LTR	1301	0.501	9.2	B	1071	0.408	8.5	B
SB TR	249	0.182	16.3	C	231	0.167	16.2	C
Overall		0.379	10.3	B		0.316	9.8	B
Williamsburg Street East and Wythe Avenue (Location 11)								
EB TR	940	0.630	15.3	C	885	0.594	14.9	B
EB R	1	0.001	10.4	B	1	0.001	10.4	B
SB L	130	0.163	11.2	B	136	0.170	11.3	B
SB LT	322	0.189	11.4	B	416	0.244	11.7	B
Overall		0.409	14.0	B		0.419	13.6	B
Park Avenue and Classon Avenue (Location 12)								
EB DfL	189	1.732	*	F	209	1.237	*	F
EB T	180	0.209	6.9	B	287	0.334	7.5	B
WB TR	592	0.574	9.3	B	485	0.472	8.4	B
NB LTR	546	0.364	11.6	B	388	0.260	11.1	B
Overall		*	*	F		*	*	F

Table D-5 (Cont.)

Summary of LOS Analysis – Museum Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Flushing Avenue and Navy Street (Location 13)								
EB LTR	63	0.053	5.1	B	107	0.090	5.2	B
WB LTR	1041	0.782	11.9	B	527	0.406	6.7	B
NB LTR	469	0.377	20.3	C	525	0.377	20.3	C
SB LTR	154	0.205	19.0	C	–	–	–	–
SB DfL	–	–	–	–	239	1.490	*	F
SB TR	–	–	–	–	187	0.334	20.0	C
Overall		0.649	14.7	B		*	*	F
Park Avenue West and Navy Street (Location 14)								
WB LTR	988	0.468	9.3	B	658	0.315	8.2	B
NB LT	271	0.250	16.4	C	273	0.284	16.6	C
SB T	165	0.128	15.6	C	394	0.306	16.8	C
Overall		0.383	11.4	B		0.311	12.5	B
Park Avenue East and Navy Street (Location 15)								
EB LT	378	0.178	7.5	B	615	0.287	8.0	B
NB T	229	0.177	15.9	C	247	0.191	16.0	C
SB LT	280	0.272	16.5	C	467	0.474	18.3	C
Overall		0.214	12.5	B		0.360	13.1	B

Note: EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound
L=Left, R=Right, T=Through
* Indicates an approach that is expected to operate at a volume/capacity ratio greater than 1:2. In such cases, the stopped delay is not calculated, but LOS is F.
– Indicates an unsignalized intersection.

Table D-6

Summary of LOS Analysis – As-of-Right Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Williamsburg Street West and Kent Avenue (Location 2)								
WB LT	1025	0.419	10.9	B	651	0.267	9.8	B
NB L	126	0.295	14.4	B	123	0.441	16.1	C
NB T	426	0.320	14.5	B	407	0.306	14.4	B
SB T	194	0.138	13.3	B	384	0.274	14.2	B
Overall		0.375	12.2	B		0.344	12.5	B
Classon/Rutledge Street and Kent Avenue (Location 3)								
EB L	958	0.435	13.3	B	1283	0.599	15.4	C
EB LTR	64	0.456	13.4	B	75	0.597	14.9	B
NB TR	543	0.300	12.1	B	368	0.203	11.5	B
SB L	5	0.020	10.5	B	9	0.026	10.5	B
SB T	148	0.099	10.9	B	196	0.131	11.0	B
Overall		0.378	12.7	B		0.401	13.9	B
Williamsburg Street West and Flushing Avenue (Location 4)								
WB LTR	1508	0.733	17.1	C	1151	0.539	14.5	B
NB LT	1276	1.226	*	F	–	–	–	–
NB DfL	–	–	–	–	303	4.885	*	F
NB TR	–	–	–	–	272	0.313	11.9	B
SB TR	474	0.299	11.7	B	1521	0.955	27.9	D
Overall		*	*	F		*	*	F

Table D-6 (Cont.)

Summary of LOS Analysis – As-of-Right Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Classon Avenue and Flushing Avenue (Location 5)								
EB LTR	1730	0.795	18.3	C	1242	0.582	14.9	B
NB TR	643	0.746	18.1	C	402	0.465	13.2	B
SB DfL	213	2.882	*	F	640	2.909	*	F
SB T	132	0.155	10.8	B	298	0.349	12.2	B
Overall		*	*	F		*	*	F
Flushing Avenue and Clinton Avenue (Location 6)								
EB LTR	246	0.290	4.7	A	345	0.366	5.0	A
WB LTR	849	0.869	13.0	B	1018	1.843	*	F
NB LTR	406	0.660	11.5	B	106	0.174	8.0	B
SB LTR	56	0.098	7.7	B	128	0.182	8.0	B
Overall		0.785	11.1	B		*	*	F
Park Avenue West and Clinton Avenue (Location 7)								
WB LTR	1145	0.481	7.0	B	825	0.347	6.1	B
NB LT	441	0.530	21.9	C	128	0.593	31.1	D
SB TR	197	0.334	20.1	C	684	0.167	18.9	C
Overall		0.497	12.1	B		1.155	*	F
Park Avenue East and Clinton Avenue (Location 8)								
EB LTR	645	0.267	5.7	B	944	0.388	6.3	B
NB TR	329	0.527	22.0	C	126	0.209	19.2	C
SB LT	164	0.297	19.8	C	567	0.808	28.5	D
Overall		0.350	12.3	B		0.523	14.8	B

Table D-6 (Cont.)

Summary of LOS Analysis – As-of-Right Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Clymer Avenue and Kent Avenue (Location 9)								
EB LTR	82	0.217	15.9	C	131	0.344	16.6	C
WB DfL	108	0.219	15.9	C	122	0.294	16.3	C
WB TR	45	0.072	15.2	C	32	0.049	15.1	C
NB L	68	0.195	3.7	A	41	0.169	3.6	A
NB LT	369	0.242	3.8	A	382	0.250	3.8	A
SB TR	406	0.324	4.1	A	509	0.405	4.4	A
Overall		0.294	6.5	B		0.387	7.0	B
Williamsburg Street West and Wythe Avenue (Location 10)								
WB LTR	1487	0.561	9.7	B	1113	0.423	8.6	B
SB TR	249	0.182	16.3	C	231	0.167	16.2	C
Overall		0.416	10.6	B		0.326	9.9	B
Williamsburg Street East and Wythe Avenue (Location 11)								
EB TR	1046	0.701	16.5	C	1350	0.905	23.6	C
EB R	1	0.001	10.4	B	5	0.007	10.4	B
SB L	130	0.163	11.2	B	136	0.170	11.3	B
SB LT	322	0.189	11.4	B	416	0.244	11.7	B
Overall		0.445	14.9	B		0.575	20.1	C
Park Avenue and Classon Avenue (Location 12)								
EB DfL	189	1.732	*	F	209	1.237	*	F
EB T	180	0.209	6.9	B	287	0.334	7.5	B
WB TR	592	0.574	9.3	B	485	0.472	8.4	B
NB LTR	676	0.448	12.2	B	404	0.271	11.1	B
Overall		*	*	F		*	*	F

Table D-6 (Cont.)

Summary of LOS Analysis – As-of-Right Alternative

Intersection	AM Peak Period				PM Peak Period			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
Flushing Avenue and Navy Street (Location 13)								
EB LTR	63	0.053	5.1	B	107	0.090	5.2	B
WB LTR	1041	0.782	11.9	B	527	0.406	6.7	B
NB LTR	469	0.377	20.3	C	525	0.377	20.3	C
SB LTR	154	0.205	19.0	C	–	–	–	–
SB DfL	–	–	–	–	239	1.490	*	F
SB TR	–	–	–	–	187	0.334	20.0	C
Overall		0.649	14.7	B		*	*	F
Park Avenue West and Navy Street (Location 14)								
WB LTR	1014	0.480	9.4	B	774	0.367	8.5	B
NB LT	271	0.250	16.4	C	273	0.284	16.6	C
SB T	165	0.128	15.6	C	394	0.306	16.8	C
Overall		0.390	11.4	B		0.343	12.3	B
Park Avenue East and Navy Street (Location 15)								
EB LT	465	0.218	7.7	B	626	0.293	8.1	B
NB T	229	0.177	15.9	C	247	0.191	16.0	C
SB LT	280	0.272	16.5	C	467	0.474	18.3	C
Overall		0.239	12.1	B		0.364	13.1	B

Note: EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound
L=Left, R=Right, T=Through
* Indicates an approach that is expected to operate at a volume/capacity ratio greater than 1:2. In such cases, the stopped delay is not calculated, but LOS is F.
– Indicates an unsignalized intersection.

APPENDIX E

ON-SITE AIR QUALITY IMPACT ANALYSIS

E.1 Emission Rate Estimates

Impact on the proposed on-site sensitive land uses, such as institutional facilities, residential places, etc., may result from existing off-site major stationary sources that are relatively close to the project site. These nearby major stationary sources are located within an approximately 4,260-foot (ft) (1,300 meter [m]) radius of the project site (Figure E-1, Air Emission Source Locations) and include:

- Con Edison power plant (Con Ed), located at 1-11 Hudson Avenue, Brooklyn, approximately 4,260 ft (1,300 m) from the project site. Con Ed consists of four boilers and three gas turbines; and

- Brooklyn Navy Yard Cogen Plant (BNYCP), located at Cumberland Street, Brooklyn, approximately 3,100 ft (950 m) from the project site. BNYCP consists of two dry and low-NO_x gas turbines.

The exhaust gas emitted from these two major stationary sources contains gaseous products of combustion and includes various criteria pollutants. These sources are currently operated under the air permits issued by the New York State Department of Environmental Conservation (NYSDEC). The permitted emission factors are the maximum potential emission limits applied to the permitted emission sources. These emission limits are defined in the unit of pounds (lbs) of pollutant per million British Thermal Units (MMBTU) of heat input. They are either included in the air permit or provided by the source operators (Scano, August 15, 1997; Agasian, September 11, 1997). These maximum emission limits for each identified major source are summarized in Table E-1.

Conservative estimates of the amount of criteria pollutants that are potentially emitted from these sources are presented in Table E-2. The permissible emission rates were calculated by multiplying emission limits by source hourly heat input.

According to the data provided in the air permits, the heat inputs for each identified source are summarized as follows:

- Con Ed four boilers: 2,728 MMBTU/hr;
- Con Ed gas turbines: 235 MMBTU/hr/turbine; and
- BNYCP gas turbines: 1,503 MMBTU/hr/turbine.

Based on this information, the hourly permissible emission rate for each pollutant and for each source can be estimated. A sample NO_2 emission rate calculation for the four Con Ed boilers is illustrated in the following textbox.

Sample No$_2$ Emission Rate Calculation for the Four Con Edison Boilers

When

Hourly heat input	=	2,728 MMBTU/hr
Emission limit	=	0.383 lb/MMBTU

then

Hourly NO$_2$ emission rate	=	2,728 MMBTU/hr X 0.383 lb/MMBTU
	=	1,044.8 lb/hr (see Table E-2)

Table E-1

Emission Limits (lbs/MMBTU)

Pollutant	Con Ed Boilers	Con Ed Gas Turbines	BNYCP Gas Turbine
NO_2	0.383[a]	0.53[c]	0.038[b]
SO_2	0.300[a]	0.307[a]	0.021[b]
CO	0.034[a]	0.071[c]	0.012[b]
TSP, PM10	0.100[b]	0.061[d]	0.018[b]

Source:
[a] provided by Con Ed facility operator
[b] provided in air permits
[c] provided in Con Ed measurement data
[d] adopted from the USEPA AP-42 emission factor (Table 3.1-2)

Table E-2

Permissible Emission Rates

Pollutant	Con Ed Boilers		Con Ed Gas Turbines		BNYCP Gas Turbines	
	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
NO_2	1044.8	131.6	373.7	47.1	114.2	14.4
SO_2	818.4	103.1	216.4	27.3	63.1	8.0
CO	92.8	11.7	50.1	6.3	36.1	4.5
TSP/ PM10	272.8	34.4	43.0	5.4	54.1	6.8

Air Emission Source Locations

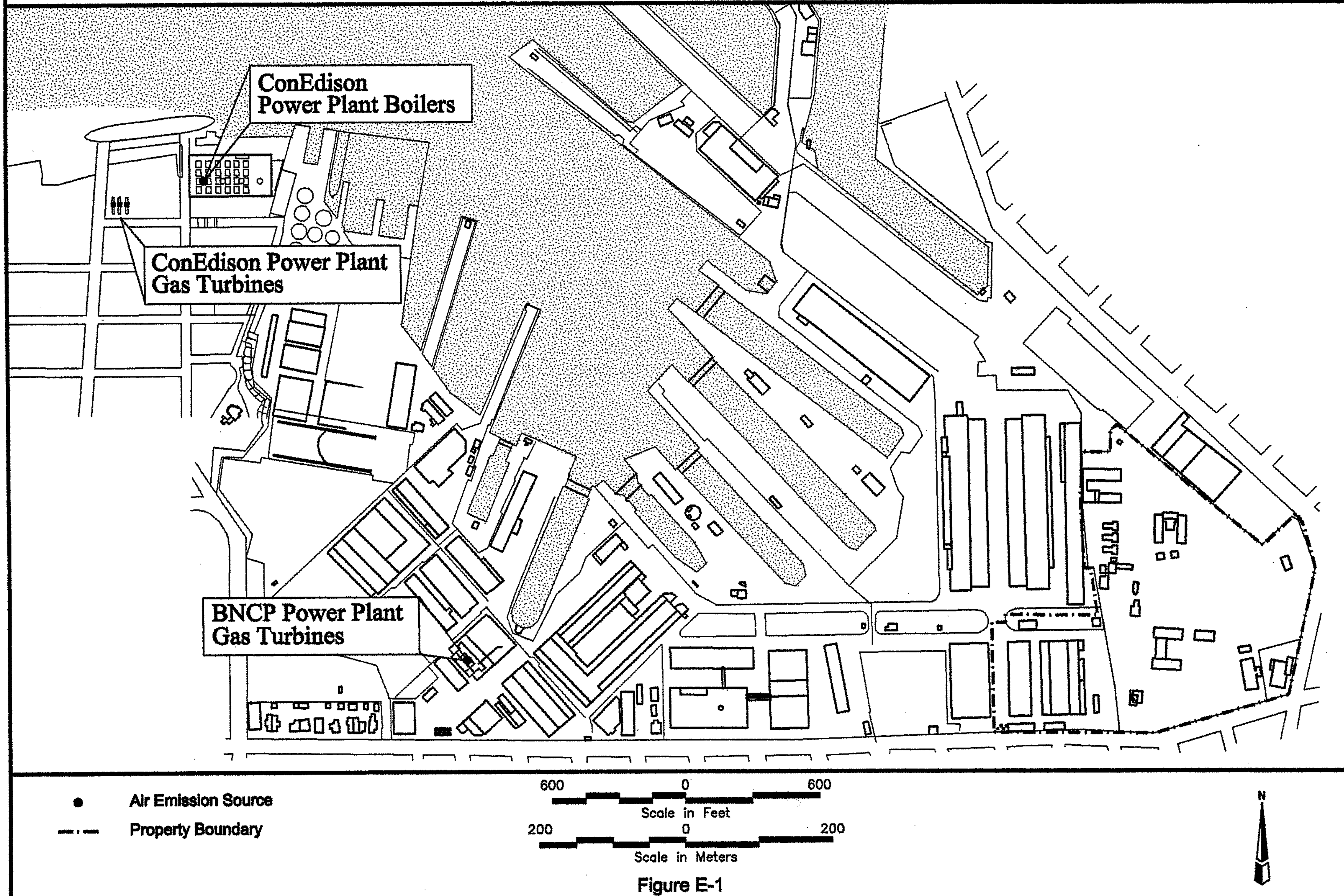


Figure E-1

The emission rates calculated in the unit of grams per second were used in the impact dispersion modeling analysis described below.

E.2 On-site Impact Dispersion Modeling

This part of the appendix describes the methods and procedures used to conduct the ambient air quality dispersion modeling analysis of the potential stationary-source air quality impacts from the proposed action. Specifically, the focus is on-site impacts from off-site major stationary sources. The modeling analysis evaluated the following criteria pollutants for which the US Environmental Protection Agency (USEPA) has established the National Ambient Air Quality Standards (NAAQS):

- Carbon Monoxide (CO);
- Nitrogen Dioxide (NO_2);
- Sulfur Dioxide (SO_2);
- Inhalable Particulates (PM10); and
- Total Suspended Particulates (TSP) (Formerly designated as a criteria pollutant by the USEPA and still adopted by NYSDEC as a criteria pollutant, all PM10 emissions are conservatively assumed to be TSP in this analysis).

E.2.1 Site Location

The NAVSTA Brooklyn site has an average ground-level elevation of approximately 30 ft (nine m) above mean sea level (AMSL). The terrain is fairly flat around the site.

The land use within 1.9 miles (mi) (three kilometers [km]) of the site was characterized using the USEPA-recommended Auer technique (Auer, 1978) to determine the appropriate dispersion coefficients for use in the dispersion modeling. It appears that the project area can be classified as "urban" for dispersion modeling purposes since the surrounding land uses have been well-developed into industrial, commercial, or residential uses.

E.2.2 Source Location and Configuration

The Con Ed power plant and the BNYCP combined have three pollutant sources that may have impacts on the proposed land uses:

- Con Ed Power Plant:
  - four combustion boilers that share one exhaust stack;
  - three gas turbine stacks; and

- BNYCP:
  - two gas turbine stacks.

The physical parameters of these pollutant sources are summarized in Table E-3. Stack base elevations were determined based on the USGS map, and other source parameters were obtained from individual air permits or from the source operator.

The relationship of nearby buildings and terrain to an elevated point source is an important consideration in dispersion modeling. Good Engineering Practice (GEP) stack height is defined as the highest of:

- 65 m, or

- a height established by applying the formula:

$H_g = H + 1.5\ L$

where: H_g = GEP stack height,

H = Height of the structure or nearby structure; and

L = Lesser dimension (height or projected width) of the nearby structure.

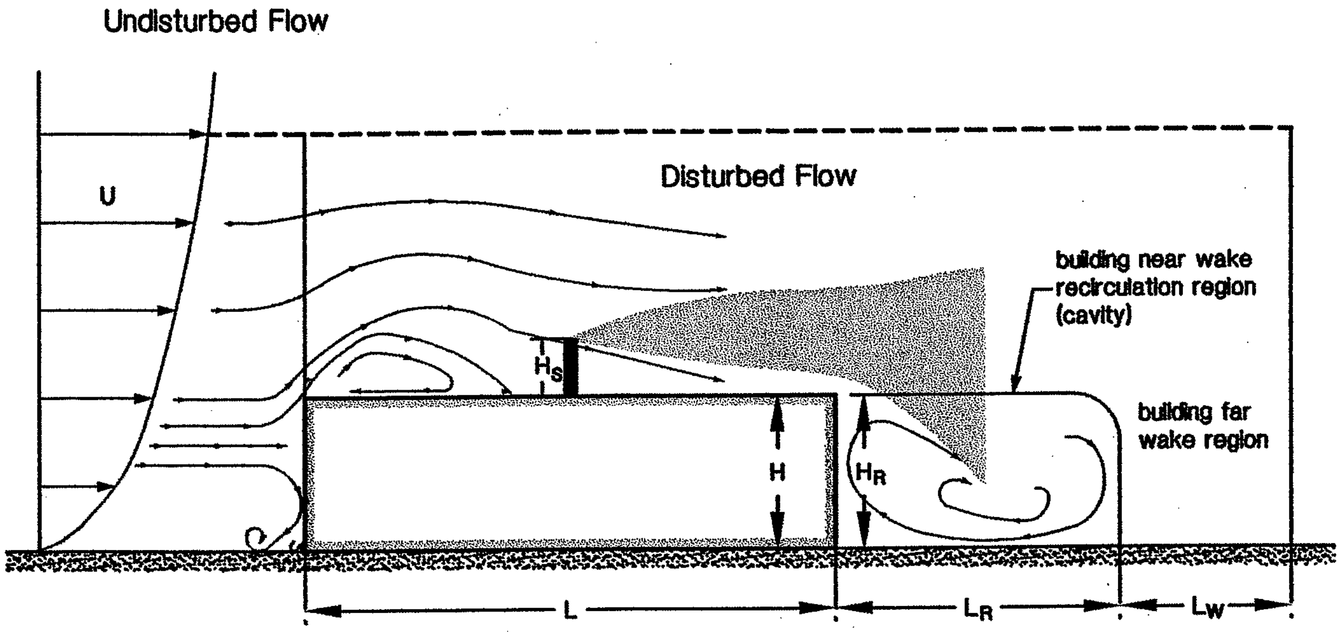
USEPA's recommended guideline air quality dispersion model, Industrial Source Complex Model (ISCST3), contains two algorithms that assess the effect of building downwash: the Hüber-Snyder and Schulman-Scire methods. These algorithms require the development of directional dependent downwash parameters as model input.

The GEP stack and downwash analyses were performed using the USEPA Building Profile Input Program (BPIP, Version 95086). The BPIP program was used to determine: 1) GEP stack height, 2) the area of influence for each nearby building, 3) the area of influence for directionally dependent building downwash, and 4) the specific building directional dimensions required for model input.

Generally, if a stack is less than the GEP stack height, the effects of building downwash on plume rise (Figure E-2, Air Flow over a Building) could potentially result in higher downwind concentrations. In this case, the buildings that are dominant for downwash effect are the plant control buildings. According to the building dimensions input to the BPIP, the calculated GEP stack heights for each stack group are:

- 102.9 m for the Con Ed boiler stack (actual height is 114.9 m, above GEP height);
- 102.9 m for the Con Ed gas turbine stacks (actual height is 14.3 m); and
- 97.5 m for the BNYCP gas turbine stacks (actual height is 94.5 m).

Air Flow over a Building



H_S = Stack Height
H = Building Height
L = Building Length
L_R = Cavity Length
H_R = Cavity Height
L_W = Far Wake Region Length
U = Air Flow (Wind) Speed

Figure E-2

Table E-3

Summary of Source Parameters for Modeling

Source	BNYCP Gas Turbine[a]	Con Edison Boilers[b]	Con Edison Gas Turbines
Base Elevation (ft)	10.0	8.0	8.0
Height (m)	94.5	114.9	14.3
Temperature (K)	416.5	489.0	774.8
Diameter (m)	5.2	7.0	2.8
Exit Velocity (m/seconds)	21.2	12.5	39.0

Note: [a] Stack parameters are for each of the two gas turbines.
[b] Stack parameters are for all four boilers exhaust to one stack.
[c] Stack parameters are for each of the three gas turbines.
Source: Air permits and facsimile from source operators (Scano, 1997 and Agasian, 1997)

Since the source release heights used for the Con Ed and BNYCP gas turbine stacks are below the GEP stack height, the building downwash effect on them needs to be evaluated. The BPIP calculated building dimensions and directional dependance for 36 wind angles (every ten degrees) for each modeled gas turbine stack (Table E-4). The source control buildings are considered the dominant downwash buildings and the calculated building dimensions were then used in ISCST3 dispersion modeling analysis.

Furthermore, the stack plume impacts caused by building cavities must also be determined. Generally, building cavities (Figure E-2) are considered to be limited to within three times the building height or projected building width from the source (whichever is smaller) of any given building. Based upon this definition, the stack building cavities are not expected to exceed the shortest distance to the closest sensitive receptor location (approximately 2,360 ft [720 m] from BNYCP stacks and 3,510 ft [1,070 m] from Con Ed stacks). Therefore, estimates of pollutant concentrations within building cavity recirculation regions are not necessary for this project.

E.2.3 Modeling Methodology

The dispersion modeling techniques used are consistent with the *Guideline on Air Quality Models* (USEPA, 1997), and the most recent USEPA-approved numerical dispersion model was used. Air quality impacts for the modeled pollutants were determined at receptor locations for the applicable averaging periods and then compared to the pollutant ambient air quality standards established by the USEPA and NYSDEC.

Table E-4

Summary of BPIP Results for Con Edison and BNYCP Gas Turbines

Direction (degrees)	Con Edison Gas Turbines		BNYCP Gas Turbines	
	Building Height (m)	Maximum Projected Width (m)	Building Height (m)	Maximum Projected Width (m)
10	0.00	0.00	42.06	12.74
20	0.00	0.00	42.06	11.71
30	0.00	0.00	42.06	10.82
40	0.00	0.00	0.00	0.00
50	41.15	116.78	42.06	9.01
60	41.15	106.31	42.06	10.36
70	0.00	0.00	42.06	11.40
80	0.00	0.00	42.06	12.08
90	0.00	0.00	42.06	12.41
100	0.00	0.00	42.06	12.35
110	0.00	0.00	42.06	11.92
120	0.00	0.00	39.01	41.00
130	0.00	0.00	42.06	10.02
140	0.00	0.00	42.06	9.44
150	0.00	0.00	42.06	10.81
160	0.00	0.00	42.06	11.85
170	0.00	0.00	42.06	12.53
180	0.00	0.00	42.06	12.83
190	0.00	0.00	42.06	12.74
200	0.00	0.00	42.06	11.71
210	0.00	0.00	42.06	10.82
220	0.00	0.00	0.00	0.00
230	41.15	116.78	42.06	9.01
240	41.15	106.31	42.06	10.36
250	41.15	92.61	42.06	11.40
260	41.15	76.10	42.06	12.08
270	41.15	57.79	39.01	79.67
280	0.00	0.00	39.01	68.74
290	0.00	0.00	39.01	55.72
300	0.00	0.00	39.01	41.00
310	0.00	0.00	42.06	10.02
320	0.00	0.00	42.06	9.44
330	0.00	0.00	42.06	10.81
340	0.00	0.00	42.06	11.85
350	0.00	0.00	42.06	12.53
360	0.00	0.00	42.06	12.83

ISCST3 Dispersion Model

For this analysis, ISCST3 (Version No. 97363), the USEPA-approved refined air quality dispersion model for simple terrain (i.e., terrain below stack height), was used. This model is used to assess pollutant concentrations for industrial facilities and to calculate impacts for several different averaging periods such as one-hour and annual. The model also contains algorithms for calculating concentrations within building wake regions due to building downwash effects. A summary of the ISCST3 modeling inputs for this study are summarized in Table E-5.

Meteorology

Five years (1993 – 1997) of available meteorological data were used in the ISCST3 model. The data included hourly surface observations from the National Weather Service (NWS) at La Guardia Airport and coincidental upper-air data (daily mixing heights) from the NWS in Atlantic City, NJ for 1993 and from the NWS at Brookhaven, NY for 1994 to 1997. It should be noted that the upper-air measurements from the NWS at Atlantic City were terminated in 1994; thus, in this analysis, the measurements from the new NWS at Brookhaven, NY were used for the later years. The La Guardia Airport station is located approximately five mi (eight km) northeast of the project site. The Atlantic City NWS station is located approximately 99 mi (160 km) south of the site and the Brookhaven NWS station is located about 62 mi (100 km) east of the site.

A windrose representing the frequency of wind directions and wind speeds of near the site (based on La Guardia Airport surface measurements) is presented in Figure E-3, Wind Rose. This windrose indicates that, from 1993 to 1997, the predominant winds at the site were from the northeast and south quadrants. Since upper-air data are used to determine the temperature structure of the upper atmosphere on a regional scale, the Atlantic City and Brookhaven sites are considered representative of the project area due to their proximity and similar weather conditions.

Meteorological calm conditions were retained in the database, but were not used in the dispersion modeling. This is consistent with USEPA guidance for air quality modeling (USEPA, 1997).

Receptor Locations

A total of 100 ground-level grid receptor locations, defined by a ten by ten rectangular grid with a 164-ft (50-m) horizontal spacing between each receptor, were modeled (Figure E-4, Receptor Grid). This grid covers approximately the entire project site. All grid receptors are assumed to be on the ground and have a terrain elevation of 30 ft (nine m).

Furthermore, in order to simulate the plume impact on elevated receptor locations (such as high floors of buildings), a total of 30 flagpole discrete receptors were placed at high-floor windows. Since the

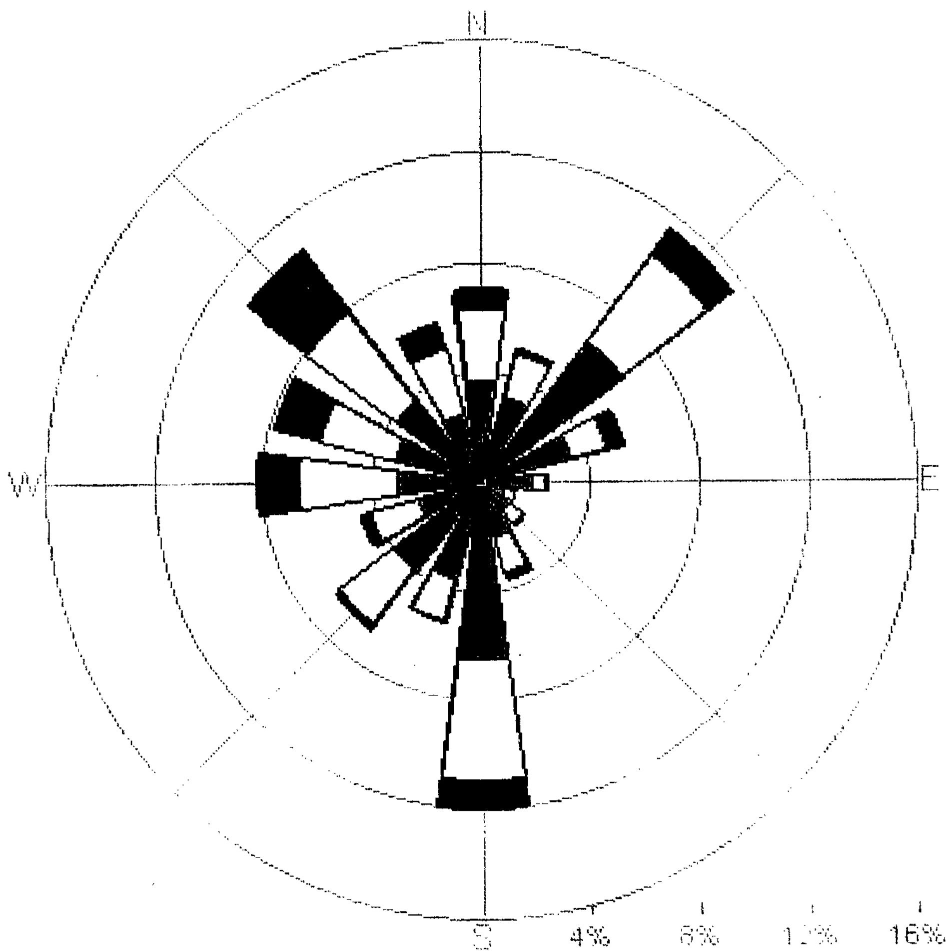
Table E-5

ISCST3 (Version 97363) Model Options

Operation	Selected Parameter
Concentration Calculation	Short-term and annual average
Receptor	Cartesian grid with 50m spacing and flag pole receptors
Dispersion Coefficient	Urban
Wind Speed Profile	Default
Temperature Gradient	Default
Plume Rise Calculation	Default
Stack Tip Downwash	Yes
Building Downwash	Yes
Buoyancy Dispersion	Yes
Calm Hours	Default – omitted from calculation
Meteorological Conditions	Year: 1993–1997 Surface Station: La Guardia Airport, NY Upper Air Station: Atlantic City, NJ (1993), Brookhaven, NY (1994–1997)

Wind Rose

LaGuardia, NY
1991-1995



- <1.54 m/s
- 1.54 - 3.09 m/s
- 3.09 - 5.14 m/s
- 5.14 - 8.23 m/s
- 8.23 - 10.80 m/s
- >10.80 m/s

Figure E-3

Air Emission Source Locations

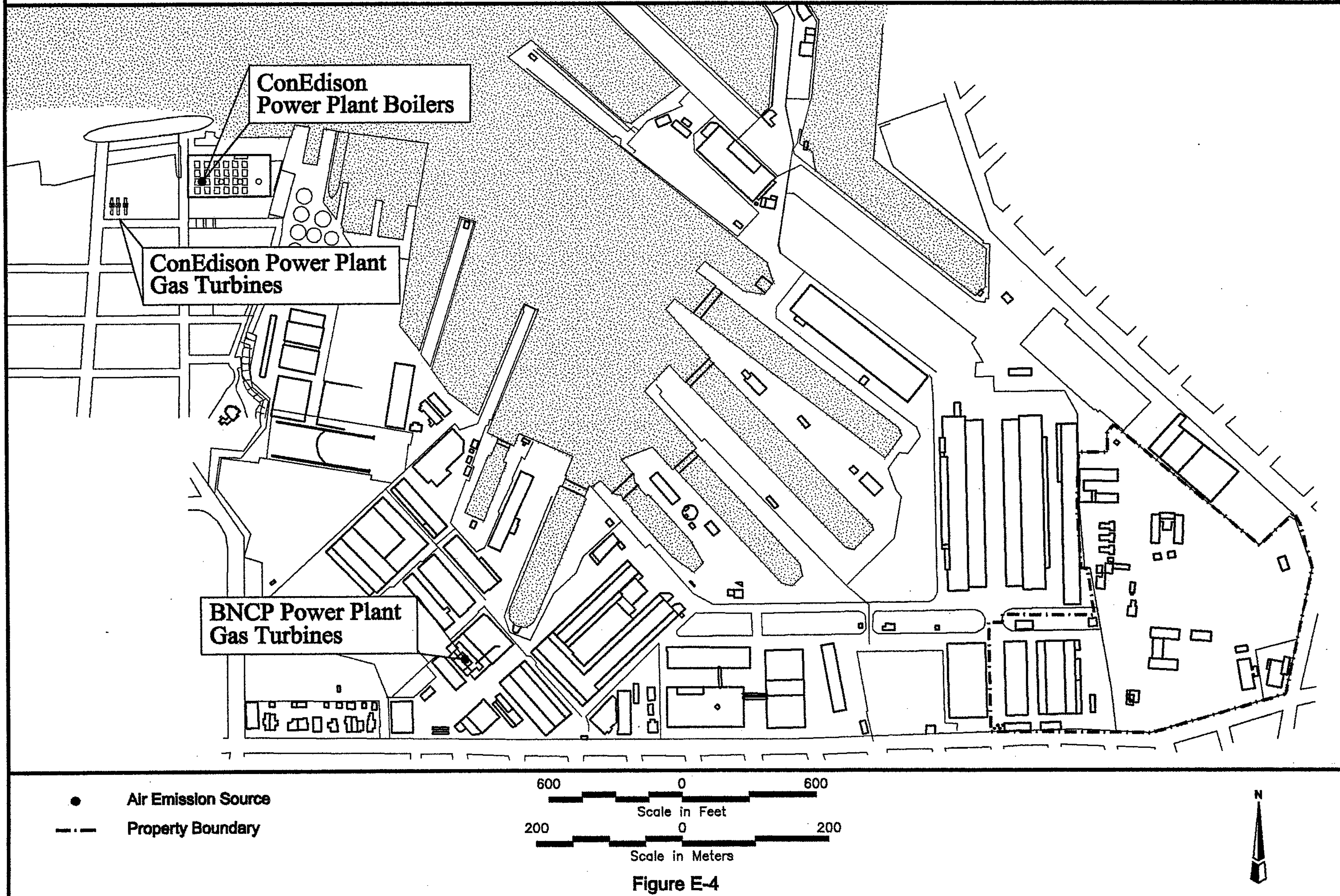


Figure E-4

height of the tallest building on site is approximately 72 ft (22 m), the elevated receptors were placed along the western edge of the property line between heights of 25 ft (7.6 m) to 75 ft (23 m) with a vertical spacing of 25 ft (7.6 m). The western property boundary is close to the modeled stationary sources and is anticipated to receive potential maximum impacts.

E.2.4 Modeling Results

Air quality impacts on the project site were predicted using the ISCST3 model in conjunction with the modeling inputs described above. The model was run for each individual pollutant and included all the sources with the potential to emit these pollutants. For the applicable averaging time, the worst-case impact concentrations (Table E-6) were identified for each pollutant. It was predicted that the western edge receptors would generally experience the highest impact from major off-site stationary sources.
To obtain the total pollutant concentration on site, the predicted impact concentrations were added to the background concentrations for the same averaging time period. The background concentration levels were provided by the NYSDEC (NYSDEC, August 1997).

The total concentrations were evaluated by comparing them to the appropriate ambient air quality standard as follows:

- For those pollutants with annual average standards, the highest computed concentration due to the project was added to the highest measured background level; and

- For those pollutants with short-term (e.g., 24-hour) standards, the highest computed concentration due to the project was added to the second-highest measured background level. Second-highest, rather than highest, background levels were used for assessing short-term impacts because compliance with short-term standards is based on the second-highest level that occurs.

The worst-case total concentrations (Table E-7) show that off-site stationary source emissions from the Con Ed power plant and the BNYCP would not result in any violations of the national or state ambient air quality standards on the project site.

Table E-6
Worst-Case Impact Concentration at Modeled Receptor Locations

Pollutant	Receptor Location			Averaging Period				
	X(m)	Y(m)	flagpole(ft)	1-hour	3-hour	8-hour	24-hour	Annual
CO	-450 -450	250 350	75 75	14 –	– –	– 7	– –	– –
NO_x	-450	400	75	–	–	–	–	8
PM10	-450 -450	150 0	75 75	– –	– –	– –	11 –	– 2
TSP	-450 -450	150 0	75 75	– –	– –	– –	11 –	– 2
SO_2	450 -450 -450	250 150 0	75 75 75	– – –	74 – –	– – –	– 38 –	– – 5

Notes: Coordinates are with respect to true north and the origin is at the southeast corner of the project site. All receptors have terrain height of 30 feet.
All concentrations are in micrograms per cubic meter of air.

Table E-7
Worst-Case Total Concentration

Pollutant/ Averaging Time	Background Concentration	Facility Impact	Total Impact	NAAQS
CO –				
8-hour	3,000	7	3,007	10,000
1-hour	4,229	14	4,243	40,000
NO_2 – Annual Arithmetic Mean	65	8	73	100
PM10 –				
Annual Arithmetic Mean	26	2	28	50
Second Highest 24-hour	64	11	75	150
TSP –				
Annual Geometric Mean	58	2	60	75
Second Highest 24-hour	98	11	109	250
SO_2 –				
Annual Arithmetic Mean	29	5	34	80
Second Highest 24-hour	134	38	172	365
Second Highest 3-hour	231	74	305	1,300

Notes: All concentrations are in micrograms per cubic meter of air.
Background Levels are from data provided by New York City Department of Environmental Protection (NYCDEP, October 2, 1998) and *1997 Annual New York State Air Quality Report* (NYSDEC, 1998).

APPENDIX F

LOCAL WATERFRONT REVITALIZATION PROGRAM POLICIES

Local Waterfront Revitalization Program

Policy 1: Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.

New York City Policy A: Improve urban shorelines by maintaining, removing or recycling waterfront structures (piers, docks, wharves etc.) in accordance with waterfront development policies and plans. Identify alternative uses for underutilized waterfront structures.

Policy 2: Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.

New York City Policy B: Improve channels as necessary to maintain and stimulate economic development.

Policy 3: Promote the development and use of the state's major ports as centers of commerce and industry; emphasizing the siting, within port area, of land use and development which is necessary to or in support of, the waterborne transportation of cargo and people. The state's major ports are the ports of Albany, Buffalo, New York, Ogdensburg, and Oswego.

Policy 4: Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity.

Policy 5: Encourage the location of development in areas where public services and facilities essential to such development are adequate.

Policy 6: Expedite existing permit procedures in order to facilitate the siting of development activities at suitable locations.

Policy 7: Significant coastal fish and wildlife habitats will be protected and preserved so as to maintain their viability as habitats. (See Section J)

Policy 8: Protect fish and wildlife resources in the coastal area from the introduction of hazardous waste and other pollutants which bioaccummulate in the foodchain or which cause significant sublethal or lethal effect on those resources. (See Section J)

Policy 9: Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks and developing new resources.

Policy 10: Further development commercial finfish, shellfish and crustacean resources in the coastal areas by encouraging the construction or improvement of existing on-shore commercial fishing facilities, increasing marketing of the state's seafood products, maintaining adequate stocks and expanding agricultural facilities.

Policy 11: Buildings and other structures will be sited on the coastal area so as to minimize damage to property and the endangering of human lives by flooding and erosion.

New York Policy C: Provide shorefront protection against central erosion hazards where there is public benefit and public use along non-public shores.

New York City Policy D: Provide technical assistance for the identification and evaluation of erosion problems, as well as the development of erosion control plans along privately-owned erosion shores.

New York City Policy E: Implement public and private structural flood and erosion control projects only when:

- Public economic and environmental benefits exceed public economic and environmental costs;
- non-structural solutions are proven to be ineffective or cost prohibitive;
- projects are compatible with other coastal management goals and objectives, including aesthetics, access and recreation;
- adverse environmental impacts are minimized;
- natural protective features are not impaired; and,
- adjacent (downdrift) shorelines are not adversely affected.

Policy 12: Activities or development in the coastal area will be undertaken so as to minimize their adverse effects upon natural features which protect against flooding and erosion.

Policy 13: The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

Policy 14: The activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion nor flooding at the site of such activities nor development at other locations.

Policy 15: Mining, excavation, or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such lands. (See Section J)

Policy 16: Public funds shall be expended for activities and development, including the construction or reconstruction of erosion control structures, only where the public benefits clearly outweigh their long term monetary and other costs including their potential for increasing erosion and their adverse effects on natural protective features.

Policy 17: Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

Policy 18: To safeguard the vital interest of the State of New York and of its citizens in the waters and other valuable resources of the state's coastal area, all practicable steps shall be taken to ensure that such interests are accorded full consideration in the deliberations, decisions and actions of state and federal bodies with authority over those waters and resources.

Policy 19: Protect, maintain and increase the level and types of access to public water-related recreation resources.

Policy 20: Access to the publicly owned foreshore or water's edge, and to the publicly owned lands immediately adjacent to these areas shall be provided, and it shall be provided in a manner compatible with the adjoining uses. To ensure that such lands remain available for public use, they will be retained in public ownership.

Policy 21: Water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over non-water-related uses along the coast.

New York City Policy F: Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of:

- immobile user groups; and
- communities without adequate waterfront park space and/or facilities. (See Section E)

New York City Policy G: Maintain and protect New York City beaches to the fullest extent possible.

Policy 22: Development when located adjacent to the shore will provide for water-related recreational activities whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities, and the primary purpose of the development. (See Section E)

Policy 23: Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation.

New York City Policy H: Insure ongoing maintenance of all waterfront parks and beaches to promote full use of secure, clean areas with fully operable facilities. (See Section E)

Policy 24: Prevent impairment of scenic resources of statewide significance. (See Section B)

Policy 25: Protect, restore and enhance the natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of coastal area.

Policy 26: Conserve and protect agricultural lands in the state's coastal area.

Policy 27: Decision on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment and the facility's need for a shorefront location.

New York City Policy I: Siting the liquefied and substitute natural gas facilities, including those associated with the tankering of such gas, shall take into consideration state and national energy needs, public safety concerns and the necessity for a shorefront location.

Policy 28: Ice management practices shall not damage significant fish and wildlife and their habitats, increase shoreline erosion or flooding or interfere with the production of hydroelectric power.

Policy 29: Encourage the development of energy resources on the outer continental shelf (OCS) and in other water bodies and ensure the environmental safety of such activities.

Policy 30: Municipal, industrial and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state water quality standards.

Policy 31: State coastal area policies and management objectives of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already over-burdened with contaminants will be recognized as being a development constraint. (See Section J)

Policy 32: Encourage the use of alternative or innovative sanitary waste systems in smaller communities where the cost of conventional facilities are unreasonably high, given the size of the existing tax base of these communities. (See Section I)

Policy 33: Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.

Policy 34: Discharge of waste material into coastal waters from vessels under the state's jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas. (See Section J)

Policy 35: Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements and protects significant fish and wildlife habitats aesthetic resources, natural protective features, important agricultural lands and wetlands. (See Section J)

Policy 36: Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters. All practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur. (See Section L)

Policy 37: Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters. (See Section J)

Policy 38: The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary sole sources of water supply. (See Section J)

Policy 39: The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface waters supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.

New York City Policy J: Adopt end-use plans for landfill areas which specify the following:

- final capacity
- final contours
- leachate, erosion and gas control systems
- re-vegetation strategies
- interim review schedules
  (See Section N)

New York City Policy K: Curtail illegal dumping throughout the coastal zone and restore areas scarred by this practice.

New York City Policy L: Encourage energy development from waste and waste landfills. (See Section N)

Policy 40: Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and will conform to state water quality standards. (See Section J and L)

Policy 41: Land use or development in the coastal area will not cause national or state air quality standards to be violated.

Policy 42: Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the federal Clean Air Act.

Policy 43: Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.

Policy 44: Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.